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NOVITATES ZOOLOGICAE.

VOL. XX., 1913.





# NOVITATES ZOOLOGICAE.

A Journal of Zoology

*IN CONNECTION WITH THE TRING MUSEUM.*

EDITED BY

THE HON. WALTER ROTHSCHILLD, F.R.S., PH.D.,

DR. ERNST HARTERT, AND DR. K. JORDAN.

VOL. XX., 1913.

*(WITH FIFTEEN PLATES.)*



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The Parts of this Volume were issued as follows :

- No. 1, containing pages 1—256 and Plates I.—XII., issued February 24th, 1913.  
No. 2, containing pages 257—472, issued June 17th, 1913.  
No. 3, containing pages 473—615 and Plates XIII.—XV., issued October 21st, 1913.  
No. 4, containing pages 617—656, issued February 1914.

## ERRATA.

- Page 15, line 12 from top, read 106 instead of 102.
- „ 29, No. 8, the subspecific name is misspelt and should be *rozskae*: see footnote on p. 589.
- „ 75, line 18 from bottom, add “nearly” between the last two words “and all.”
- „ 143, top line, the generic name should be *Phthorimaea*.
- „ 237, line 11 from bottom, should read: *Fringilla fuliginosa*, Wied, *Beitr. Naturg. Bras.* etc.
- „ 350, line 20 from top, the generic name should be *Euclidia*.
- „ 475, line 10 from bottom, read: *Clytomyias*, not *Clytomyia*.
- „ 485, lines 19 and 20 from top, read *musschenbroeckii* instead of *muschenbroeki*.
- „ 522, No. 212, read *magnifica magnifica* instead of *magnificus*.
- „ 536, line 2 from top, read *felis* instead of *felix*.
- „ 542, No. 19, specific name should read: *hyparetes* not *hyperetes*.

*Bound for the  
Library*

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PLATES I.—XII.

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FEBRUARY 1913.

No. 1.

## EXPEDITION TO THE CENTRAL WESTERN SAHARA.

By ERNST HARTERT, Ph.D.

Plates I.—XI. and Map (Pl. XII).

### EXPLANATION OF SOME ARAB AND OTHER WORDS USED IN THE NARRATIVE.

*Ain* = source. (Water rising from the ground, artesian wells and others.)

*Berber* = the original inhabitants of Africa Minor, to which the Kabyles, Shauia, Zenata, Chaamba, Touareg and others belong.

*Bir*, plural *Biar* = artificial wells, generally with artificial walls.

*Bordj* = rest-houses; generally used for the rest-houses built by the French military authorities, intended for officers or men, but also permitted to other Europeans.

*Chaambi*, plural *Chaamba* = a desert tribe of Berber origin. Formerly dreaded robbers, like the Touareg, now generally peaceful. Excellent camel-men and travellers.

*Chott* = salt lake, but mostly dry; depression with salt, where sometimes water stands after rain.

*Dhomran* = *Traganum nudatum*. Plant which is very good food for camels.

*Erg* (also *Arçg*) = Region of the Sand-dunes.

*Feggara*, plural *Feggaguir* = subterranean aqueduct, in galleries, in the central Sahara.

*Gara*, plural *Gour* = "witnesses," or remains of higher plateaus, in form of flat-topped hills or mountains.

*Gmira* = larger or smaller pyramid-shaped stoneheaps serving as landmarks, by which to find the way.

*Hammada* = stony desert, rocky plateau.

*Hassi* = wells dug in sandy soil or in rocks; generally used for wells without artificial walls, but in the farther south used for almost all wells built by men. (Apparently not Arab, but Berber).

*Mehari* = riding camel—a special breed.

*Oued* = river, or in the Sahara more generally river-bed, as rivers there very seldom have water.

*Sebcha* or *Sebkha* = depression with salt and salsolaceous plants; dry portions of *Chott*, generally with some vegetation, sometimes under water.

*Talha* = acacias.

*Tlmas* = depression in an oued with water-holes; water-holes.

The spelling of the geographical names is generally that of the French maps by Prudhomme, Niox, and Nardin.

### I.

### NARRATIVE.

AFTER having made three lengthy visits to Algeria, the ornithological results of which have been published in *Novitates Zoologicae*, vol. xviii, pp. 456–550, and having become well acquainted with the birds of the Northern Algerian Sahara, Mr. Walter Rothschild wished to extend our knowledge of the fauna of the Western Sahara farther southwards. He therefore asked me to make an expedition to In-Salah, the principal oasis of Tidikelt, in the centre of the

Western Sahara, in order to explore the ornithology of those parts of the desert, and to collect other animals and birds as well, as far as time and opportunities permitted.

We obtained, with the kind help of our friend Dr. H. C. Nissen, in Alger, the kindest possible letters of recommendation from the Governor-General of Algeria, his brother, the chief of his cabinet, and from the military authorities to the commanding officers in the south, and completed our outfit in Alger and Biskra, which we left on February 20, 1912. I was fortunate to be accompanied by Mr. Carl Hilgert, who had been with us to El-Oued in 1909 and to Ghardaia in 1911. The camels in Biskra have not a good name, and I was warned not to buy any, because they were not accustomed to arduous travels, and therefore not to be recommended for a journey to In-Salah and back. Thus I only hired the necessary animals and men as far as Touggourt, and I believe this was the right course, although more expensive. The weather was glorious, no more magnificent day being possible: a cloudless sky, calm and warm, and the desert greener than we had ever seen it before. It had rained much, I believe chiefly in November and December, and a great amount of small vegetation and countless flowers were seen almost everywhere.

From Biskra one passes first through fields, and then through a clayey and partially sandy plain with numerous low tamarisk bushes. Then one crosses the Oued Djeddi, here very small, coming from the mountains of Aflou and Laghouat and disappearing in the great Chott Melrhir. Here, a few hundred yards from the river, lies Bordj Saada, a large caravanserai, near which we pitched our tent for the first time. It was a beautiful, though cold, night; cranes flew overhead in the evening, calling loudly. The rich verdure of this winter was not so much noticed in the low-lying plain near Biskra as here. Immediately south of Bordj Saada begins a slightly elevated stony plain, and there it was that the great difference between a fertile year, like the present one, and a dry one, like that of 1909, was obvious. Not only were there many more plants, but butterflies were seen in numbers: the common and widespread *Pyrameis cardui* and *Pieris daphidice* (subsp.), the pretty yellow *Euchloe charltonia*, and on the plain south of Bordj Saada, where it becomes less stony, less bare, and where—near Bordj Chegga—*Zizyphus* bushes are numerous, *Melitaea didyma deserticola* was far from rare, though mostly more or less worn. *Euchloe charltonia* was observed as far south as Tamerna, though rare there.

Farther southwards the country becomes more sandy, and there it is that, a little northwards of Kef-el-Dor, birds peculiar to the sandy desert, such as *Galerida theklae deichteri* and *Sylvia nana deserti*, are found. South of Kef-el-Dor we descend into the great Chott Melrhir, now to a large extent actually full of water, where three years ago only the "mirage" or "fata morgana" made us believe that we saw lakes and trees; great masses of Sandgrouse, apparently all *Pterocles senegalus*, were passing high overhead, coming from the water. We were, however, greatly disappointed that we saw no water-birds whatever, though quite recently many ducks had been seen, and near Bordj Saada we had found three dead Flamingoes, which had killed themselves by striking the telegraph wires, and hundreds of Flamingoes were observed some weeks afterwards near Mraier by Frenchmen and Arabs.

At Nça-ben-Rzig we camped in the same place as in 1909, near the little oasis of palm-trees (see *Nov. Zool.* xviii, p. 460). We were troubled by small

flies, but not so much so as in the oasis of Ourir, where they were an almost unupportable plague, and a perfect torture to the mules, whose ears became swollen and stiff for a couple of days. The same pests occurred in Touggourt and Ouargla, but we did not see them farther southwards, and it is remarkable that in June they were quite absent.\* We saw several times *Pterocles alchata* flying overhead in greater and smaller troops, and obtained a few. Our last camp before Touggourt was at Tamerna, on an open space between two large oases. From Tamerna we made our last march to Touggourt—42 kilometres. This march leads partly through very dreary and uninteresting sebcha, mostly covered with nothing but one kind of plant, a *Salicornia*, forming thick bolster-like bushes, partly through sand with very little vegetation and no dunes. Hardly a bird was noticed except the "muka" (*Alaemon alaudipes*), and once a pair of *Sylvia deserticola*, of which we shot one.

From February 26 to March 2 we remained in Touggourt. Most of the time was spent in buying camels and engaging men, and all this would have taken longer had it not been for the kind help of Mr. Henry Chazelles. We made also some excursions into the gardens. Of butterflies we saw frequently one species of *Lycaena* (*L. lysimon*), *Colias croceus* (= *edusa* auct.), *Pyrameis cardui*, the common *Pieris rapae*, and once a *Pyrameis atalanta*. Of birds, *Lanius excubitor elegans*, *Turtur senegalensis aegyptiacus*, and Sparrows were common; while of migrants only *Motacilla alba alba* and *Phylloscopus collybita*, the latter sometimes singing, were observed. The little Scops-owls (*Otus scops scops*), which were common in April 1909, were absent, but *Tyto alba* (Barn-owls) were noisy on a tower in the fort—where, however, we could not shoot them.

At last, on March 2, I had bought sixteen camels and hired two mehari (riding-camels), as I could not buy any of the latter. In addition to Ahmed, our cook, translator, and headman and his assistant, both from Biskra, I engaged a guide and eight Arabs, all nomads, some of whom had travelled far and wide in the Sahara. The guide, Abd-el-Kader ben-Lakhdar, and two others were former soldiers and had seen service in Morocco and Tidikelt. These three were granted military rifles and ammunition by the authorities, and I had all the men inscribed at the Bureau Arabe, where my wishes were attended to with the greatest kindness.

On March 3 we left Touggourt for the south. We passed the rich and extensive oases and towns of Temacin and Zaouia Tamellath, where a great marabū resides, and marched about 24 km., as far as Bled-el-Ahmar, Bledet-Ahmar or Bledet-Tamar, a large village, beyond which we camped. All the way from Touggourt leads through monotonous sebcha, in places rather slippery, and intervening belts of sand with very scanty vegetation. No interesting birds were seen, except at Bledet-Ahmar some Crested Larks (*Galerida cristata arenicolor*), and Grey Shrikes, and it is remarkable that this is the southernmost place on this route where the long-billed Crested Lark is found. At this place we saw, on the edge of the gardens, two white butterflies, one of which we caught: a fresh *Euchloë belemia*! This is the southernmost place where it is known to occur. The full moon rose with the wonderful brilliancy of the desert, and the evening delivered us from the irritating, tiny sand-flies and a kind of yellowish guat that bit in the daytime and which we encountered only in this place.

\* According to Mr. E. E. Austen these flies are *Leptocnops hertszii* Kieffer, only described as late as 1908 in *Ann. Mus. Nat. Hung.* vi. from Cairo.

From Bledet-Ahmar we made a long march and pitched camp in a sandy plain. All the way led through low, rolling sand-hills, like the frozen waves of the sea in a quiet "swell," intermixed with stones and pebbles, but there were hardly any dunes. The sand was, for desert sand, fairly rich in vegetation, the bushes of *Retama raetam* reaching a height of two metres; *Limoniastrum guyonianum* was flourishing, but not yet in flower, the "Drin" (*Aristida pungens*) being frequent, *Euphorbia guyoniana* and many little flowering plants of which I do not know the names. The birds peculiar to such districts, *Alaemon alaudipes* with its melancholy song, the pretty *Sylvia nana deserti* hopping in and out the bushes, here and there *Ammomanes phoenicurus arenicolor* running along the ground and almost invisible at even a short distance, because it so perfectly matches the colour of the sand and stones. Twice the somewhat rare desert-sparrow, *Passer simplex saharae*, was seen and shot, once *Galerida theklae deichleri*, and a Raven, which, however, was too shy for us. We passed a very poor village, half engulfed in sand, many houses forsaken, the palms of a poor appearance, the water rather bad and not very clean. In the palm-trees *Lanius excubitor elegans* was seen. The night had been cold, but the day was warm. Insects and reptiles were rather scarce, while later on in the year many more are obvious. We saw here and there a *Pyrameis cardui* sailing wildly across the path, and once a *Pieris daphidice* (subsp.).

The camp, in the clean sandy plain, was very peaceful and picturesque. A *Rhizotrogus*-like beetle flew round the fires at night, but the low temperature with a bright moon spoiled the catch of lepidoptera.

On March 5 we left the sandy tract and encountered a bare gravel-plain with very scanty vegetation. No birds enlivened it except *Ammomanes phoenicurus arenicolor*, here and there a forlorn *Alaemon alaudipes* and the Cream-coloured Cursor. In spite of the short time before moonrise and the bare surroundings, some Noctuidae and Pyralidae came to the light at our camp at the Hassi Mahmar. The country from Hassi Mahmar onwards remains the same, only still barer, and interspersed with stony patches and low flat-topped table-hills, where *Erythrospiza githagina* occurs. An hour before the Hassi Arefidji sand-waves with huge Retam-bushes, Drin and Euphorbia set in. Here Grey Shrikes were common, and their eggs taken; *Crateropus fulvus* and *Sylvia nana deserti*, also *Galerida theklae deichleri* became quite numerous. A female of *Oenanthe (Saxicola) deserti* and a flight of about 30 *Calandrella brachydactyla* on passage were seen. It was again a grand night, and we hoped for a good collecting day along the sands, but unfortunately next morning the wind began to blow and made collecting very difficult; moreover about 10 km. farther we got out of the beautiful sand-waves and had to cross a tiresome sebecba with *Salsolaceae* only; towards midday sand-dunes appeared, but at the same time the wind became stronger and so boisterous that we sometimes thought it would blow us over with our camels, and that one could not see a hundred yards ahead. Thus we reached the miserable village of Nguoussa, or Bour-Nguoussa, which reminded us strongly of El-Oued, surrounded as it was by sand-dunes and the palm-gardens half hidden from sight by depressions among the hills. In the morning we had found a nest with four eggs of *Scotocerca inquieta saharae* and shot a *Galerida theklae deichleri* which had, apparently, already laid eggs.

It must here be emphasized that south of Hassi Arefidji Crested Larks were seen for the last time, and that **in all the country south from there no Crested**

**Larks of any kind occur!** From Koenig's work it was left uncertain whether any were found near Ouargla, but there are evidently none. We have in vain searched for them around Ouargla, and from inquiries made too, it is evident that no *Galerida* is found there. As I have said before, the last *Galerida cristata* were seen at Bled-el-Ahmar, south of Touggourt. This was the first of our feathered friends from the northern desert to disappear, but many others were soon to follow.

Having at last arrived at the village, we found the Bordj had collapsed, only an open verandah and one room remaining standing. This welcome shelter we occupied, and praised our luck that we had not encountered this weather yesterday among the open sand-dunes of Arefidji; for the gale came in heavy gusts, and the air was thick. We were just skinning our birds when a military doctor from Ouargla arrived on his way to Morocco, *via* Biskra and Alger, with whom we had to share the room, which was just big enough for three.

The gale diminished after midnight, and when we awoke in the morning it was quite calm.

Yesterday we had practically seen the first migratory birds, and from now not many days passed without migrants being observed. To-day, March 8, we noticed *Calandrella brachydactyla*, numerous *Phylloscopus* (apparently all *collybita*), and *Motacilla alba*. We rode as far as Ouargla, all the way through sand and sebcha recently covered with sand, and before Ouargla we had to cross very high dunes of a warm rufous colour, though this reddish hue was only due to a layer of red sand covering the usual whitish yellow dunes. *Passer simplex saharæ* was again met with.

Arriving at eleven o'clock on the crest of the dunes, we saw Ouargla before us in the distance, with a wide sheet of water to the left of the town; but it was still a long and weary ride over a lifeless and absolutely uninteresting sebcha before we reached the town, where we found primitive but tolerable accommodation in Monsieur Irisson's hotel.

Ouargla (or Wargla) is an old town with an interesting history, but not a good place for a zoologist, especially when he has to stay in the middle of the place, as we were obliged to do, our chief object here being to complete our caravan and to begin the march southwards. Down to Ouargla some zoological collecting had been done, south of it next to nothing. Koenig had visited Ouargla, and with him Dr. Krauss, who collected some insects; Lataste had done good work here, with his usual energy and success; and others had no doubt been there, since it is not very difficult to reach the place.

No zoologist had, to my knowledge, ever been south of Ouargla.

Ouargla was founded many centuries ago by Berbers and Jews, and it is now chiefly inhabited by Arabs of various tribes—Chaamba (an ancient Berber tribe), and "hartani" (descendants of liberated slaves from the Western Sudan), with an admixture of Jews converted to Islam in ancient times. All these races are more or less mixed, and not easily recognised by a stranger, especially as most of the Berbers are very black, resulting from the numerous negro women they used to marry in the times of their raids on the Sudan tribes, and the darkening of their skin is also favoured by the climate. There are also some M'zabites, who keep shops; and to the latter belong many of the date-palms, though others are claimed by the Chaamba, who come here in great numbers in the autumn for the date-crop. Thus only a fifth or so remains for the actual cultivators of the gardens, the "haratins," who very seldom are owners of any property at all. In former times

Onargla has been a great centre of commerce, especially when the M'zabites lived there, who are now concentrated in the valley of the Oued M'zab, and when, apparently, the caravan-route from Algeria *via* Biskra—Touggourt—Onargla—In Salah—Soudan was more frequented, slaves, ivory, and ostrich-feathers forming the fortune of such caravans; while now the slave-trade is prohibited, ivory finds its way direct to the west coast down the Niger and Senegal, and ostrich-feathers are only brought in small quantities. Nevertheless, even now Onargla is an important centre and much thought of by the Arabs.

The old streets of Onargla are narrow, many arched and half dark; the soldiers' barracks and houses of the officers are outside the town, in large new buildings. The town is surrounded by an ancient crenellated wall, with loopholes and a rampart-walk; and a feature of the place are the two white minarets, 25 metres high and close together. The old kasbah is no longer in existence, though its ruins can be traced. The palm-groves, or "gardens" as they are always called by the natives, are bare and generally in fairly deep depressions, though watered by wells as well as from the water of the sebcha. Every property being surrounded by high mud-walls, progress and collecting in the gardens are difficult and tiresome. Flies and the irritating little "sandflies" (*Leptoconops kerteszi* Kieffer, 1908) were frequent, and later in the season Onargla is very unhealthy; malarial fever abounds, and it seems indeed as if Onargla is the most unhealthy of all the Algerian oases.

We collected a large series of Sparrows, which are all red-headed! The only other sedentary bird we found in the palm-groves was *Turtur senegalensis aegyptiacus*. No owls were seen, and we were assured that the Scops-Owls were not known; but this statement may be erroneous, since, possibly, they had not yet arrived from the south. Of migrants we noticed *Calandrella brachydactyla*, *Phylloscopi*, *Motacilla alba alba*, *Anas crecca*, *Anas querquedula*, *Machetes pugnax*, some very shy males of *Oenanthe oenanthe*, three *Totanus* (rectius *Tringa*!) *stagnatilis*, *Totanus* (*Tringa*) *glottis*, and, on March 9, the first few *Chelidon rustica*.

Our interest was aroused in the Gara-Klima (or Gara-Krima), a flat-topped mountain about 12 kilometres from the town, through Professor Koenig's visit to that place in 1893. We therefore hired donkeys (mules or horses not being obtainable) and devoted a day to it. It is a most uninteresting hill, consisting of hardened earth with a top of rock and stones, the way to it leading through a sandy plain with a few palms and miserable nomad huts. There are here also the ruins of the M'zabite town Sedrata, which was destroyed by the Arabs. Koenig had the great luck to shoot a pale Eagle-Owl (*Bubo ascalaphus* or rectius *Bubo bubo desertorum* Erl.) and to find Buzzards' nests here; but we tried in vain to find the *Bubo*, and Buzzards were absent, though old nests, as yet empty, evidently belonging to the latter, were found. On the top of the mountain we shot a single *Oenanthe leucopyga*; and this is the first place, coming from Touggourt, where this species appears! I was greatly interested in the ruins found on top of the Gara-Klima. Koenig (*Reisen und Forsch. in Algerien*, p. 84) advanced the idea that they were Roman ruins, strengthening his theory with the fact that, according to Barth and Rohlf's, Roman remains had been found as far south as 27° north latitude. Koenig's theory, however, is erroneous. The end of the road leading to the top is crowned by a ruined archway, and one can trace houses and roads on the summit, built of crude bricks of exactly the same nature as those used for the wall sur-

rounding Ouargla ; and the bases of the houses on top are partly built of stones, roughly shaped for the purpose.

These stones induced Koenig to think they were made by Romans, but where Arabs or Berbers find stones lying about by thousands they always use them more or less when building, as one can see in hundreds of places. Moreover it is well known that the forsaken town on the top of Gara-Klima was a M'zabite town. It was the M'zabites who built the well which pierced the whole Gara to a depth of 85 metres, *i.e.* 30 metres beyond the bottom of the hill. It is now dry and probably not more than 30 metres deep ; in 1890 it was still 45 metres deep, the rest being filled up with sand. Similarly constructed wells and ruins on the tops of hills are found on the hillock of Ba-Mendil, north-west of Ouargla, and near Ghardaia. Pieces of pottery among the ruins on the top of the Gara-Klima are also of typical Berber origin. There is thus nothing whatever in favour of Koenig's theory. If, according to Rohlf's and Barth, Roman remains occur as far south as 27° N. latitude, they are certainly not found there in the Algerian Sahara. It is true that in an old Arab manuscript a statement occurs that Romans reached Ouargla ; if this should be true it would probably have been some adventurers only and not a Roman force, but they have certainly not left any traces behind.

The view from Gara-Klima is magnificent, and one sees westwards many other "gour" with more rugged sides, where probably more owls and hawks occur than on Klima.

At last, on March 13, we left Ouargla, having bought with great difficulty two mehari and two more camels, and also taken another native, a Chaambi clad in a beautiful purple gown who had an old gun and his own very hardy though old and sore riding-camel ; he was a very useful man, well versed in travelling, shooting and hunting, and full of fun, improvising a concert almost every night, not to the benefit of our cooking-pots, one of which formed the solitary musical instrument, the rest of the din being singing, yelling and clapping of hands.

For 20 kilometres our way led over an absolutely bare *selcha*, resembling an endless harrowed field ; then it became gravelly, afterwards more stony, and at a distance of about 22 km. there commenced almost bare clay hills with low cliffs (Pl. IX., lower photo), and broken up by numerous dry ancient water courses. These hills were inhabited by a few pairs of *Oenanthe* (*Saxicola* auct.) *leucopyga* and a pair of *Oenanthe lugens halophila*. A pair of Ravens (doubtless *umbrinus*) were seen, and some old nests, perhaps of Buzzards, were found. After a short ascent we had to descend again, and entered a bare rolling stony plateau where only a few *Anmmomanes phoenicurus arenicolor* occurred. A solitary swallow flitted across the ground. On the 14th we continued the march over the hammada, descending somewhat, though the plain remained the same, only here and there interspersed with pans of fine mealy soil, absolutely bare and tiresome to cross ; two or three times a Muka (*Alaemon alaudipes*) was heard and seen, once an *Oenanthe deserti*, once a Cream-coloured Cursor, twice a solitary Kestrel and three single Swallows. Moreover, this dreary day was cold, dull and windy, and we rode all day in our overcoats. In the evening some few moths came to the light. Our Chaambi tried target-shooting with his gun, one barrel of which was burst open ; as his shots went too low, he bent the barrel slightly with his foot. Needless to say, I always kept at a safe distance when he was shooting, but the gun never burst any more, at least not as long as he was with us. On the 15th the journey was continued for a long time over the same monotonous flat plain, which changed to

a gravelly stretch and at last to a vast plain of a glittering white like snow, being covered with dust like plaster of Paris, and interspersed with hillocks of crystallised gypsum, while a few kilometres to the east enormous bare sand-dunes, about a hundred metres high, bordered the view, and near the dunes were some "gour" of hard sandy clay. On the steep cliffs of these "gour" nested a pair of *Oenanthe lugens*, and we saw Ravens, Egyptian Vultures (*Neophron*), a single *Falco biarmicus erlangeri*, some *Calandrella brachydactyla* on passage, and one *Sylvia nana deserti* on the other side of the sand-mountains. It was very windy, but in the evening it calmed down and we had a very nice catch of insects on the lamp, and were greatly amused by the large quantities of a small sand-coloured Blattid, which flew to the light and ran about with enormous swiftness, trying most eagerly to enter the gauze cage in which the lamp was placed. We stopped two nights at Hassi el-Hadjar, as the camels required a rest-day, and continued our journey on the 17th through dreadfully monotonous, uninteresting bare stony desert ("hammada"), interspersed with stretches resembling an ill-kept gravel path in a neglected garden, and here and there with a flat-topped clay hill. We saw a solitary Raven, one *Neophron*, three *Milvus korschun*, *Alaemon alaudipes*, *Calandrella brachydactyla*, and a single *Anthus campestris*. Three Gazelles were sighted, but too shy to approach: they had curved horns and appeared to be of the *dorcas* group. Our Arabs took a clutch of three eggs of *Milvus korschun* on one of the "gour." On the 18th we rode one hour through reddish sand with scanty vegetation, where *Certhilauda* and *Cursorius* were seen, then again the endless dreary "gravel-path." Hilgert saw at a great distance what seemed to him to be a cream-coloured jackal (?) with some rufous on head and tail; I saw several very shy Gazelles. In the evening we had a strong but very short rain. On the 19th hammada became more frequent, *Ammomanes phoenicurus arvicolor* was occasionally seen, a mammal, *Meriones schousboei*, was not very rare, though quite local. A *Euchloë* was distinctly seen, but not obtained. Traces and dung of Gazelles were found in quantities.

About 184 kilometres south of Ouargla some rocks of a white colour appeared, and at once *Oenanthe leucopyga* was in evidence; *Phoenicurus phoenicurus* and *Anthus campestris* were observed on migration. In the evening of the 20th a fairly heavy rain took place, lasting two hours or so. A very deep well without water was found in a depression, evidently an old lake-bed, and a new well was being dug not far away, but so far water had not been struck. Near the camp, in the "Oued Djafou," *Phylloscopus trochilus*, *Oenanthe oenanthe*, and a Brown Kite were seen. On the 22nd it was only + 7° C. in the morning, but beautifully warm afterwards. The day, however, was a day of ill luck. We saw two *Ammomanes deserti* but did not get them; I missed a Raven; our men caught a young gazelle, but we got no shot at an old one. We found several nests both of *Oenanthe leucopyga* and *Sylvia nana deserti*, but all were empty. It was five o'clock before we reached camp, and thus we went through a day of hard work—having been in the saddle and on foot for ten hours—without any valuable results at all. We caught a *Cerastes cerastes* (Horned viper), and found a pretty *Convolvulus* which was new to us (*Conr. supinus*, var. *leucotrichus* Kral., teste Schweinfurth). In the afternoon we came into sandy country with high *Retama raelam* and other typical forms of the sand-flora, though the sand, which had a warm reddish yellow colour, formed only a thin layer on top of whitish rock. On the following day we soon



abandoned the sand and came upon a stony plateau, only here and there with a thin layer of sand, and flat-topped rocks of a white and red colour; *Passer simplex saharæ* was not rare in the sandy stretches.

Towards midday Hassi Iniquel was reached, near the rocks called Safet-Iniquel. It was interesting to see the camels drink after a week without water. Although they greatly enjoyed the drink, and drank a good quantity, they got hardly excited, and kept up their slow, measured, dignified walk, and only a few tried to push off and bite others in order to get quicker to the water; the quantity consumed by each camel was not greater than that drunk by a thirsty horse. On March 24 we crossed some very fine high sand-dunes, and then a stony plain, until at last we came to the edge of the plateau, and saw before us El-Golea, with its old fortress, isolated "gour," palm groves, gardens, villages, and military buildings, in a belt of sebcha, extending from north to south, between the plateau on which we were in the east, and the immense sand-dunes of the Great Western Erg in the west. (Pl. I.)

In El-Golea we were most heartily welcomed by the French officers, who invited us to be their guests during our stay there. The commandant, Lieutenant Maire-Séville, gave us comfortable rooms in his house. El-Golea had formerly a large garrison, with a general in command, but now, since the stations are pushed southwards to Adrar, In-Salah, and the Hoggar mountains, it has lost much of its importance as a military centre, and there are now only a small number of men with two to three officers, in addition to the commandant or chief of the "Bureau Arabe," whose duties are entirely administrative. This military administration of the French Sahara is well adapted to the native character, and is generally carried out admirably well by specially instructed officers.

El-Golea is a charming place, a real little paradise in the middle of a vast and wide desert. The gardens of the officers are very large, being made for a great number who formerly were garrisoned here, and under the palm-trees, eucalyptus, apricots and peaches grow roses, violets, and many kinds of vegetables, there being a number of artesian wells emitting an enormous supply of water of a warm temperature, pure as crystal and good and healthy to drink. But what is the most surprising thing is a real lake of fresh water, formed by a very prolific artesian well, and with enormously high and thickly grown reeds (*Arundo donax*), surrounded by trees and bushes. Needless to say this lake is a winter resort of many kinds of ducks and water-fowl, as well as numerous small birds; but for the water-birds we were a bit too late. Bird-migration, however, began in grand style during our stay at El-Golea, from March 24 to 30. Scops-Owls (*Otus scops scops*) were very numerous in the gardens, calling frequently at night. *Motacilla flava flava* was common, a few *M. f. cinereocapilla* were seen, *Oenanthe oenanthe oenanthe* was quite the commonest bird, and hundreds were caught by the boys for food. *Phoenicurus phoenicurus* was numerous, likewise both species of *Phylloscopus*, *Lanius senator*, *Oenanthe (Saxicola) hispanica*, *Anthus campestris*, a few *Anthus pratensis*, *Chelidon rustica*, *Hirundo urtica urtica*, *Riparia riparia*, *Jynx torquilla torquilla*, *Calandrella brachydactyla*, *Sylvia curruca*, *Muscicapa atricapilla* (or rather *hypoleuca*), *Upupa epops* not rare. On the lake *Circus rufus*, *Ardea ralloides*, *Tringa (Totanus) stagnatilis*, *ocrophus*, *glareola*, *hypoleuca*, *Gallinago gallinago* and *gallinula*, *Ibis falcinellus* and *Fulica atra* were observed, and mostly obtained.

The Coot (*F. atra*, and not *cristata*!) were seen in a few pairs only, and we were told they nested on the lake, where they stayed all the year round.

In the oasis and gardens no bird was observed of which we could already say with absolute certainty that it nested there, except the Grey-headed House-Sparrow, which is exceedingly numerous, nesting in trees and on houses, and having eggs and young already.

There is a high and steep descent from the plateau downwards, and millions of fossil shells are seen in many places. Some detached rocks are entirely covered with fossils, and specimens are lying about in many places. According to Rolland (*Géologie du Sahara*, 1890, p. 55) they belong mostly to the genera *Ostrea* (about half a dozen species), *Plicatula*, *Rhabdocidaris*, *Strombus*, *Cardium*, *Janira*, *Holcetypus*.

On an isolated rock above El-Golea stands the forsaken and now partly ruined old fortress and town of the Berbers (Pl. I.). It is apparently 500 or 600 years old, and was built by the Zenata, a people of the great Berber tribe, and of doubtful limits. Evidently the Zenates are nothing else than a southern portion of the Berbers, living in the Saharan oases, who, about 600 years ago, settled among the Jews, who at that time occupied—and had partly founded—a number of oases from the Oued Rirh (south of Biskra) to Tonat and Tidikelt. These Zenates had probably been shifted to and fro by the various Arab invasions, and at last settled down, founding the oasis of El-Golea, as it is now called by the French, under the name of El-Meniâa, and under the latter it is still universally known to the Arabs. More or less nomadic, the Zenata for a time left their "El-Meniâa" during the summer months, going to the Oued Megiden and other places, to feed their herds, but by-and-by they became more sedentary, and have now settled down entirely. Though for native arms formidable and almost impregnable, the fortress was occupied by the French for a time, and is now, as I said above, quite forsaken.

I ascended the old fortress (Pl. I.) with some of the French officers, and obtained a beautiful view over the oasis and beyond into the wide Western Erg, an ocean of sand-dunes. In an empty half-subterranean dwelling thousands of Bats, *Asellia tridens*, were found.

In the lake and ditches are millions of a water-shell, *Melanopsis dufourii*, a frog (*Rana esculenta* var. *saharica* Blgr.), and the European Tench (*Tinca*) has been introduced from France and thrives well.

On March 30 we left the hospitable oasis, with its flowers and comfort, accompanied by our kind host for an hour or so. As usual in all oases, it was time for our men to leave, who were satisfactory enough in the field, but in the "towas" became debauched and lazy, with a few exceptions. The first part of our way led through dreary sebcha, resembling an absolutely bare freshly ploughed field, covered with salt, glittering silvery white in the sun.

On our right was the Great Western Erg, its high sand-dunes sharply silhouetted against the unbroken blue sky. *Limoniastrum* bushes stood at the edge of the sebcha, where the sand began, in great luxuriance and often eight or nine feet high, now covered with reddish violet flowers.

*Alaemon alaudipes* and *Cursorius* were the only resident birds seen; Hoopoes were observed in great numbers in the oasis. Towards midday we traversed for about seven kilometres a rough hammada with a little sand, blown over from the Erg, and then descended into a depression where reeds stood in quantities, proving that water must from time to time run into the place (Pl. II.). Here was also a

bush which in the south we saw only here: *Nitraria tridentata*. After some search we found the Hassi Okseibat. The water was only 3 metres from the surface, but an old dry well was near by.

This place is probably—like many others—an ancient resting-place of caravans. Here, as in many other similar places, we found many eggshells of extinct ostriches, probably *Psammornis rothschildi* Andrews. The camp was most picturesque, but there was little life, only the Fennek (the little creamy white desert-fox), *Aluemon*, and of migrant birds *Anthus campestris* being noticed.

On the 31st we marched over a stony plateau with a good deal of small vegetation, to the Hassi Marroket, or Marrokat as the Arabs call it, where excellent water was found about 7 or 8 metres from the surface. In the well, 2½ metres deep, *Saxicola leucopyga* had hard-set eggs, and on the stone wall protecting the well *Passer simplex* had a nest, unfortunately as yet without eggs.

On April 1 we ascended again the stony plateau, then crossed a number of high dunes, among which we lost the way for some time because our guide attempted to take a short cut, and thus subjected the camels to a very tiresome and partly unnecessary toiling over steep sandhills. *Gazella leptoceros loderi* was seen; but a heavy gale began to blow as soon as we entered the dunes and raged with increased force until we reached a depression called “daya-bou-Ziane,” where it reached its height. With great difficulty, making use of occasional lulls, the tent was erected. The gale then came in blasts with tremendous roar, and hot, as if coming from a big furnace, and no collecting of any kind could be done, but I obtained photographs of the moving sand-dunes (Pl. III.). The so-called “daya” contained very large tamarix-bushes—some 3 and even 4 metres high—but no other bushes of any kind. The dunes covered solid rocks of red and white colours. Many of these dunes have a nucleus of rock, and I suspect even the highest dunes have bases of stone, covered with sand. Here the rocks that were visible here and there were smooth as if polished, probably by the action of the sand. Few birds were seen: a *Milvus korschun*, a single Wryneck and a single *Oenanthe (Saxicola) deserti*. Since El-Golea we were on the track of the French column which marched down to Tidikelt in 1900. Even the ruts of the cannon were still visible in some places, and in one place we found the ruins of a stone house with numerous empty provision-tins, showing that French soldiers had camped there. In the stone walls were nests of *Passer simplex*, but still empty. Much of the tinned meat for the French army comes from New Caledonia and Madagascar. The stay in camp was not pleasant: the sand penetrated everything, the heat was great and almost suffocating, and we had work—birds to skin, reptiles to prepare, etc. Moreover the spirit-boxes from the British Museum would not unlock, the locks being too fine and complicated, and had to be taken to pieces.

Next day we passed through a stony plain almost without any vegetation and, for a change, two high dune-belts; but, about two in the afternoon, we reached the beautiful valley of El-Meksa, surrounded by rocky hills covered with sand and high dunes; the valley was full of flowering plants (especially *Henophytum deserti*) on which huge flies were numerous. These flies were hawking about in such a manner that we at first thought they were a kind of *Macroglossum* or other Hawkmoth. *Corvus corax umbrinus* and *Falco biarmicus erlangeri* were seen, *Passer simplex saharæ* and *Ammomanes phoenicurus arenicolor*; of migrants only *Chelidon rustica*. Ascending the surrounding hammada to the south, we came upon a wide plain with hard brown soil covered with innumerable stones and without

vegetation, without life, of a bareness surpassing everything we had seen. Camel-skeletons began to be frequent, and we counted 24 in three hours.

A hundred kilometres south of El-Golea, near a small gorge, we came upon three stone-heaps, the graves of Lieutenant V. M. A. Collot and two native soldiers, who were here shot by some Chaamba, lying in ambush in the little gorge, on October 31, 1896. A stone plate states in simple words the tragedy (Pl. IV.). These silent graves in the vast and lifeless desert make a great impression on the traveller who passes them. Towards eleven o'clock (April 3), we descended into the wide bed of the Oued Saret. Here we found a very rich vegetation, and I preserved as many species of plants as I could find. Besides a kind of grass (*Pennisetum ciliare*), the strong-smelling *Decerra scoparia* was the most numerous flowering plant, and a few kilometres farther upwards huge bushes of *Zizyphus* were found. We camped near a well without water. *Calandrella brachydactyla* was about in flocks, *Oenanthe (Saxicola) hispanica* was noticed, a female *Circus macrourus* shot, *Falco biarmicus erlangeri* observed, and here was obtained for the first time *Ammodramus deserti mya*, the new lark so common in the region of the Southern Oued Mya. Swallows were seen flitting to and fro. Unfortunately a heavy wind troubled us all day long, frustrating any close observations, giving much trouble in mounting the tent, and disturbing our rest during the night. On the next morning we marched for some distance along the bed of the Oued Saret, seeing many spoor of Gazelles, observing *Sylvia cantillans*, *Chelidon rustica*, *Oenanthe oenanthe*, *Motacilla flava flava* and *Monticola saxatilis saxatilis*. Then followed again a bare hammada, with black stones, as if burned by the heat of the sun, and mostly not the least vegetation, sometimes not one green leaf or a blade of grass for hours, but plenty of camel-skeletons. According to our Arabs, most of these skeletons are from the military expedition of 1900 to In-Salah, when nearly a thousand (?) camels are said to have been lost; but at all times camels occasionally break down and die on the roadside, where food and water are scarce. Traces were seen of gazelles and of a jackal or fox; a snake was caught and a solitary Yellow Wagtail observed. Here, where stones are frequent, the road is marked with stone-heaps and erect flat stones, bearing the numbers of the kilometres, so that nobody can lose the way. At midday we reached "Fort Miribel," or as the natives say "Hassi Chebaba" or "Chebbebba," situated on the height above the river-bed of the "Oued Chebaba," amidst the most dreary and lifeless country one can imagine, though the river-bed has a certain amount of vegetation.

Fort Miribel is a fortress with many rooms round a big courtyard, and rather well built of mud-bricks; in the oued below are the ruins of the buildings, where the Spahis (native cavalry) were quartered, round the old well, and near several new ones, some of which are now dry and gradually filling up with sand. For some years a fairly strong garrison was stationed at Fort Miribel, but now it has been abandoned as useless, because of the southern garrisons at In-Salah, Touat, and in the Hoggar mountains, and the peaceful state of the country. An irresponsible Arab is supposed to watch the place, but the sand is encroaching on the fort, piling up hills along the surrounding walls, filling the rooms through the broken windows or the doors carelessly left open, the courtyard and the cellars; locks are being taken away by anyone who fancies them, walls are beginning to tumble down, and in a few years the place will be in ruins, a haunt of the Black Chats and *Ammodramus deserti mya*.

We ascended the hill and occupied two of the best rooms, where we prepared

our birds and other things; but it was cold, and a heavy gale blew sand in masses over the place, so that we were glad of our comfortable quarters. Near the wells in the valley stands a broken column in memory of the murdered lieutenant Collot: an inscription in French and one in Arabic were on the sides of this dignified monument, but the French one was already broken away when we passed the same way in May.

On April 5 a cold gale blew from the north, and though we had  $+8^{\circ}$  C. in the morning at seven o'clock, and as much as a maximum of  $+14^{\circ}$  in the afternoon, we felt cold all day, the sun not shining, the wind blowing incessantly. On the lifeless plateau we came here and there across a clayey stretch, showing traces of Gazelles, little rodents, and Bustards. In the afternoon we reached the "mouse-river," Oued Far, where we erected the tent with the greatest difficulty. Near this river-bed we saw two Chaamba with Mehari and many sheep grazing in some depressions with a few *Zizyphus* bushes. The map calls these wretched places "dayas"; but they have, of course, nothing to do with the wonderful dayas of the district of Tihrempt, between Ghardaia and Lghouat.

Several times we were able to hand postcards to the post-rider, called boshaat. Mails are conveyed by single natives on camels, who ride day and night. They have a rifle, generally well wrapped in, so as to keep the sand off, and have no fear whatever, and nobody molests them (Pl. V.).

On April 6, after a long march over undulating, bare, stony plateaus, we came to the first tributary of the great Oued Mya system. It was a surprising sight which gladdened our hearts when we suddenly saw before us, from the barest hammada, a wide river-bed with tufts of grass, flowering plants, and huge, thick-stemmed tamarisks, affording shade enough for us to sit down and eat our luncheon of sardines, Arab bread, and dates, with water from El-Golea. After a short rest we crossed again some stony plateaus, descending first into the "Oued Tinbourbar," then into the "Oued Sidi-Djilali-Lakhdar," and once more, down a steep ravine, toilsome and dangerous for camels, to the "Oued Tindjamat," where enormous cliffs, reminding us of El-Kantara on a lesser scale, walled in the wide river-bed. Through these and other tributaries of the Southern Oued Mya, and at last in the bed of the southernmost bend of the real Mya river, we marched five days. These days were delightful, and gave us plenty of work—though, unfortunately, several days were very windy, making impossible any moth-collecting, and often spoiling the day's work.

The river-beds (Pl. VI., upper photo, Pl. VII.) are generally full of bushes of *Retama*, many huge tamarisks, and here and there enormous *Zizyphus*, and the banks are, especially along the southernmost bend of the real Oued Mya, full of flowers, mostly yellow and pale lilac. We had not seen a butterfly since El-Golea, and here we were greeted by numerous *Pieris duplidgei albidice* and *Euchloë falloui obsolescens*, and twice we saw a *Papilio machaon hospitonides*, once also a *Danaüs chrysippus*, many *Pyramis cardui*, and *Colias croceus*. On the 11th hundreds of *Celerio lineata livornica* were seen hawking about in the sun, and we secured a number of them. Of reptiles a black form of *Uromastix acanthinurus* was found to be not rare, but difficult to catch among the rocks, and a few lizards and snakes were caught.

All the surrounding heights are as bare as possible, without the slightest sign of vegetation, and all the game has to come down to the river-beds for food. There are only a few water-places, and they are not wells, but only "tilmas," *i.e.*

water-holes in the sand of the river-bed, generally open, but sometimes covered up with a flat stone, or filled up with sand; when the sand is dug away for a foot or two the water soon fills up the hole, and thus, by and by, some amount of liquid is gained, and it is quite drinkable, being well filtered through the sand. During the six days in the Oued Mya region we camped twice on a "tilmas" with water, and we passed another on the way; but it would probably not be difficult to sink wells in other places along the river-beds.

Now, during the second week of April, migrants passed through in great quantities. We observed and partly collected: *Luscinia megarhyncha megarhyncha* (once), several *Oenanthe oenanthe oenanthe* and one *O. o. leucorrhœa*, *O. hispanica*, *Saxicola (Pratincola auct.) rubetra* and *rubicola*, *Phylloscopus collybita* and *trochilus*, *Phoenicurus phoenicurus*, *Sylvia curruca* and *cantillans*, *S. conspicillata* (rare), *Motacilla flava flava*, *Anthus trivialis* and *campestris*, *Calandrella brachydactyla* (two flocks), *Lanius senator* (common), *Chelidon rustica*, *Hirundo urtica*, *Riparia riparia*, *Upupa epops* (a few), a flock of *Merops apiaster*, a single Quail. We also found numerous pellets and the remains of a Scops-owl (*Otus scops*), showing that these birds must have passed through quite recently.

Of mammals we caught a few smaller rodents, shot a new "guïdi" (*Massoutiera harterti*), and saw many traces of gazelles, Barbary-sheep, jackals, and—apparently—foxes. Hares were common, and we shot several. We also found the remains of a hedgehog-skin. Of resident birds only *Ammomanes deserti mya* and *Oenanthe (Saxicola) leucopyga* were more or less common and widespread, and two or three times single specimens or pairs of *Erythrospiza githaginea* were observed. *Falco biarmicus erlangeri* nested on the cliffs, and eggs were taken; *Buteo ferox circensis* was observed twice, a young *Neophron*, Ravens, and a single *Milvus horschun* were noticed, and on the way back a single *Athene noctua saharæ* was shot.

Very interesting moths were collected at night, but some evenings were cold and stormy, and once it rained for five minutes—huge drops, not enough to refresh even the plants. The amount of verdure and flowers in the river-beds was due to heavy rains having fallen in December or January, flooding the rivers to a great height, and making them impassable for caravans and post-riders. This state, however, lasted only a few days, and the water had not even reached the neighbourhood of Hassi Inifel (north-east of El-Golea), where Lient. Maire-Séville found no trace of rain and not a green leaf or blade in May, while in former times the waters must sometimes have rolled on northwards at least to south of Ouargla, where they were lost in the sand. Rolland (cf. his admirable works on the "Hydrologie" and "Géologie du Sahara Algérien") was probably the first to regard the Oued Rhir (extending from Touggourt to the Chott Melrhir) as a continuation of the Oued Mya, which would then have been united with the Chott Melrhir by way of the Sebcha of Ouargla, the Sebcha Safroun, north of Ngoussa, the Chott Bardad, and the Chotts of Bledet-Ahmar, and Temassiu. This theory has generally been accepted; but it is, to me, difficult to imagine that enough rain used to fall on the plateau of Tademaït to send the waters up to Touggourt and farther, and the Oued Mya certainly drains only the Tademaït. On the other hand, the Oued Igharghar comes from the massive of the Hoggar Mountains, and its waters were, I should think, much greater and more likely to extend to the Chott Melrhir, so that the Oued Rhir appears to be more likely a continuation of the Oued Igharghar than of the Oued Mya, which only drains the plateau of Tademaït.

On the other hand, it must be remembered that the Tademaït is an absolutely bare rocky plateau, the rain-water running off as from a table, and filling the affluents of the Mya without much loss, so that one single torrential rain would send down incredible volumes of water to the Oued Mya. It is, of course, known that the alluvial and diluvial deposits of the northern Sahara have been transported there from the south, and not from the north.\* The Atlas Mountains send their waters to the Mediterranean and not to the Sahara. What small rivers there are (like the Oued El-Kantara, later on called Oued Biskra and the Oued Djeddi) do not extend far to the south.

On April 11 we left the last bend of the beautiful Oued Mya and ascended again a dry and bare hammada. After a long and tedious march, during which we saw many camel skeletons (on this day we counted 102), we came to the end of the great plateau of Tademaït and descended into the gorge of Aïn Guettara (Pl. VIII.). It was time that we came to a halt, as some of our camels had cut their feet on the sharp stones and were bleeding freely. This ravine is very picturesque, the cliffs are steep and rugged, the river-bed deep and full of boulders of various sizes. Generally it is very bare, but here and there some small flowering plants are seen, and small acacias grow sparingly along the valley. The famous well (Aïn) is a small dribbling source, the water of which is collected in a basin, and a similar source is about a hundred yards away. A group of date-palms (Plate VII.) stands near the source—a welcome sight, for, with the exception of a solitary tree of its kind below Fort Miribel, we had not seen a palm since El-Golea. The French have made a fairly good road through the gorge, well marked with kilometre stones. Formerly the passage through it must have been formidable, and numerous skeletons of camels show that it was no child's play. We camped two days in the gorge, but without much success. The first evening some moths and beetles were caught, but a heavy wind spoiled the second night. It came from the south, in gusts, hot as if out of an oven, and carried with it brown dust like powdered chocolate, which pervaded everything, and was, to my mind, worse than sand. A new form of "gundi," called *Massoutiera harterti* by Mr. Oldfield Thomas, is found in small numbers, and a huge Barbary-sheep looked down upon our camp from the highest rock on the first evening. Birds are scarce; of *Passeres* only *Ammomanes deserti mya* and *Oenanthe leucopyga* breed in small numbers. We found several huge nests, but all were empty. No large birds were seen, but on our way home a pair of Buzzards (*Buteo ferox circensis*) were observed, and also a pair of *Falco biarmicus erlangeri*—all, however, so shy that we could not shoot them. Traces of jackals were noticed, but traps were put out in vain. Of migrants, Swallows, Pipit, a Hoopoe, *Sylvia conspicillata*, *Sylvia curruca*, *S. melanocephala* (once), *Lanius senator*, and *Phylloscopus collybita* were noticed.

On the 13th we left Aïn Guettara, and after passing a long dreary hammada, entered a river-bed with numerous large acacias ("talhas"), reminding us of tropical African landscape (Pl. X.). A Wryneck was seen in one of the acacias. A Gazelle was viewed, but not obtained. Soon we were out of this valley again, and crossed a gravel-range with countless small spherical stones, like so many ancient gun-balls, but without vegetation, after which followed a river-bed of a new character: the "Oued el-Abiod" or "White River," a frequent name in the Sahara. There is

\* A. Pomel, *Le Sahara*, 1872. Cf. Rolland, *Géologie du Sahara*, p. 98.

much sand in the Oued el-Abiod, but it appears to be recently blown over, and to rest on a basis of rock and gravel. The vegetation is peculiar: thick tufts of a large grass (probably an *Andropogon*), and here and there a *Zizyphus*. Here and everywhere in the south Grey Shrikes were absent, while *Lanius excubitor elegans* occurs everywhere in the north where *Zizyphus* abounds. We found, however, an old nest in one of the bushes here, which might have been a Shrike's nest. Here, on the sand of the river-bed, however, *Alaemon alaudipes* and *Ammomanes phoenicurus arenicolor* were seen and promptly shot. The night was once more a wild and unpleasant one; a heavy gale was blowing, and we were covered with sand. Nevertheless we caught a few moths in a sheltered depression, and among them a new species: *Chilena hilgerti*, of which a second specimen was caught in exactly the same spot a fortnight later.

On April 14 we made the longest march of our journey: over 50 km., to Foggaret-es-Zoua, the first of the Tidikelt oases. After leaving the river-bed we came upon a gravelly plain with many round stone-balls. At first we had to our right and left many grotesquely shaped rocks and "gour" (flat-topped hills), but they were soon left behind, and we came upon the barest and most hopelessly lifeless stretch ever seen. The plain appeared to be endless; far in the distance we saw the palms of Foggaret-es-Zoua, but they seemed to be as far after hours and hours as when we had first sighted them at eleven o'clock, and it was past five o'clock when we reached the houses. The village is not large, but the houses are peculiar, low, many of the better ones crenellated quite ornamentally; and the inhabitants wear mostly garments like the Touareg, though they are Arabs and other Berbers.

The surroundings are very dreary, as rain has—apparently—not fallen to any extent for many years, the last twenty years having been exceedingly dry. Where Rohlfs, in 1864, saw much verdure and food for camels, and extensive thickets of "Dhomran" (*Tragacanth nudatum*), we found no trace of green, but dead roots and twigs of bushes, said to have been "Dhomran" by our Arabs. I dug several of these out, and found them dead to the roots.

The evening was cool, but we were troubled by gnats, and could not sleep in the stuffy house which we had entered in order to save the mounting of our tent.

At six o'clock the next morning we left Foggaret-es-Zoua, and at eleven we reached the pretty little oasis of Igosten. To our left we saw almost all the time the palm-groves and houses of Foggaret-el-Arab, as it is now called.

Rohlfs was the first European who saw the oases of Tidikelt. He called the "Foggaret-el-Arab" of to-day "Fogura el-Arb"; our Igosten of to-day he called Gusten or Igesten, and our Arabs also said generally "Gosten," never "Igosten." We found Igosten very interesting. According to Deporter (1899) the districts of Foggaret-es-Zoua and Igosten had 2,300 inhabitants, of whom 69 were Zenata (*i.e.* Berbers), 1,362 Arabs (of the tribes Oulad-Sidi-El-Hadj-Mohamed, Oulad-Sidi-Cheikh, Oulad-Yaich, Oulad-Zoumit, Oulad-Taleb-Ali, and Kel-Ahmellen\*), 594 Harratin (descendants of freed slaves), 270 Negroes and 20 Touaregs. The Touareg, however, are not, as a rule, sedentary in Tidikelt, but come in great numbers in the autumn to buy dates and other necessaries; the inhabitants are mostly clad like Touareg, veiled in dark blue-black robes, so that only the eyes and hands are visible, and many understand the language of the Touareg, the interesting "Tomashek."

\* The latter said to be Touareg by Rohlfs, though they call themselves Arabs. (?)



We found a fairly comfortable, but stuffy, airless "Bordj," which we occupied. The keeper brought food for the camels, eggs, and dates. The village is half buried in sand, though on the crests of the dunes hedges of palm-leaves are erected, in order to stop the inroad of the sand. The palm-gardens are fairly extensive, and onions and gourds are grown in great numbers, also wheat, barley, cabbage, turnips, red pepper, and cotton, in small quantities.

*Phylloscopi*, *Muscicapa hypoleuca* (*atricapilla* auct.), *Oenanthe oenanthe*, *Hirundo urbica* and *rustica* were common on passage; a single female *Tinnunculus* was seen, and a White Stork which was very dirty and evidently ill. Only one bird was breeding freely: the grey-headed Sparrow. The nests were numerous in palm-trees. Of insects a common *Cicindela* was caught, some *Lycaena*, and a single *Danaïis*.

The inhabitants were kind, though some of them rather shy. A number of boys accompanied us, when we went out to collect, among them one of great beauty and noble figure; he was of a lighter colour than most of the others, who were mostly as black as negroes, and partly real Sudanese blacks.

On April 16 we rode to In-Salah, where we were welcomed with the greatest cordiality and kindness by the Commandant, Captain Payn, and his officers. Two large rooms were given us in the fort, and we were happy to find letters from Europe and from Alger, from our wives, friends, and relations.

The little fortress, "Fort Bugeaud," is picturesquely built of baked clay with roofs and rafters of palm-stems, and some distance from the villages. Only the French officers and "sons-officiers," and the native Saharians are stationed within the fort, and a sentry watches day and night from the watch-tower. The mess-rooms (the "popotte") with a library are situated outside, and in them we found a photo of Captain Haywood, who passed through In-Salah two years ago, on his journey from Timbuktu to Biskra.

Most of the Arabs in In-Salah belong to the tribe of the Oulad-bu-Hamu (Ouled-bu-Homo of Rohlf's); many are Mrabtin (Marabutin of Rohlf's), and a great number Hartani (descendants of slaves), and Negroes. A few Chaamba live also in the villages (Pl. X.). The houses are built as in Igosten, and the natives have a very wholesome respect of the Europeans; sometimes even fear, and we found them always decent and willing to do little things for us, such as bringing in specimens, climbing trees, carrying cartridges, birds, etc.

The gardens (Pl. XI.) have no walls, but are separated by hedges of palm-leaves. Under the palms were grown many onions, very few figs and pomegranates, which are said to be small and often to dry up before they ripen, on account of the heat; in the summer some *Sorghum* (millet), and in the winter wheat or barley are grown. Onions and red pepper are cultivated.\*

Here, as in Igosten, the Grey-headed Sparrow was numerous, nesting in the palms, and here and there on houses. Possibly *Hippolais reiseri* may breed here; the males were singing freely, but their testicles were not yet much developed. A female Kestrel and a Stork were observed, but both were apparently remnants from the migration period. Of migrants many *Phylloscopus trochilus*, *collybita* and *bonelli* were seen, but they became strikingly rarer on the 19th, *Turdus turtur arenicola*, *Jynx torquilla*, *Hirundo urbica* and *rustica*, *Merops apiaster*, *Lanius senator*, *Motacilla flava cinereicapilla*, *Oenanthe oenanthe oenanthe*, *Saxicola*

\* Henna (*Lawsonia inermis*) is apparently only grown in South Tonat, in the district of the Oued-el-Henna (Martin's *Oasis Sahar*, p. 308).

(*Pratincola* auct.) *rubetra*, *Muscicapa hypoleuca* (*atricapilla* auct.), *Luscinia megarhyncha*.

No butterflies were noticed, but a dragonfly was not uncommon in the officers' gardens. During our stay in In-Salah the nights were mostly cool; once a heavy gale was blowing, and very few moths were noticed. Of beetles the common *Anthia sexmaculata* and many *Tenebrionidae* were frequent, and a number of rodents and reptiles were brought in. The water-ditches in the oasis were choke-full of a water-plant (*Chara foetida* var.) and two species of water-shells, *Melania tuberculata* Möller and *Melanopsis dufourii* Férussac, were common. A frog, a new form of *Rana esculenta*, the same as in El-Golea, was very numerous; it had, at that time, half-grown tadpoles.

Although very little rain had fallen for a long time in the neighbourhood, the sebcha of In-Salah still contained some water. Nearly all the water, at least all the drinkable water, is got from the "Foggaras."

The palm groves are always on or near some sebcha—except where, as in El-Oued, the roots of the palms, which are planted in holes, reach to the moist layer under the sand, and grow without irrigation. The sebcha-water, however, is not drinkable, and it became therefore necessary to get other water. There either being no wholesome water, or the latter too deep, water found four to six metres deep is tapped, and brought to where it is required by long subterranean aqueducts, the "Foggaras." They are often many miles long, and their way is shown by numerous covered openings and wells. These galleries drain the water throughout their courses, and end generally in the palm groves, which they irrigate. Sometimes huge subterranean chambers are excavated, where numbers of people can assemble.

The Foggaras are a cause of constant anxiety, being watched, repaired and enlarged; but, what is rather disquieting, the volumes of water obtained from them have considerably diminished of late. The Arabs claim to be the originators of this unique system of irrigation, but it is more likely that Berbers or Jews are the inventors, as the Arab, noble and gentlemanlike as he may be, has never been much of an inventor, and Berbers and Jews, with the help of Negroes, have been and are now the workmen of the Sahara.

It is impossible to say how much influence the early Jewish immigration into the West Saharan oases has had on the country. It appears, however, to be certain that in olden times, apparently after the destruction of the Temple by Titus, Jews poured into the Cyrenaica, and thence penetrated into the Sahara, where they founded colonies, making the Negroes (and probably Berbers) work for them. They seem to have even converted (in the northern Sahara) some Berbers to their religion; but later on, in 1492—*i.e.* long after the Arab immigration and the islamisation of the Sahara—the synagogue in Tamentit (Touat) was destroyed and nearly all the Jews were killed, unless they embraced the Mohammedan religion, which was done by many; these latter, the islamised Jews, are the present "Mehadjeria." They are still found in small numbers in Touat and Gourara, and even in the north in Touggourt and the Oued R'hir, but there are said to be none in Tidikelt. (See A. G. P. Martin, *Les Oasis Sahariennes*, 1908.)

The principal food of the inhabitants is the date; in the summer, when dates become rare, wheat and barley, and in the winter millet (*Sorghum*) is grown. Meat is not eaten regularly, but only on festivals. It may be imagined what a failure of the date crop may mean, when it happens, as it has happened this year, that the dates

fell off before they were ripe, on account of the exceptional summer heat. Two meals are eaten, one in the morning, mostly consisting of dates, one in the evening, consisting of "couscous" and bread.

The houses are small and dark, but in the summer they are hardly inhabited at all, all life being spent in the open and on the flat housetops. It is said that probably more than half the houses would tumble down if a heavy rainfall, as in olden times, took place, and therefore the Tidikeltians hate the idea of a heavy rain.

Of domestic animals the only one of the greatest importance and necessity is the camel. Tidikelt camels are excellent, and especially their mehari (riding-camels) are famous. Sheep and goats are kept, and a very few donkeys. Horses are not reared now, and the few in the hands of French officers and Kaïds have been brought there with great cost from the north, and do not seem to propagate.\* Fowls are kept in some numbers, but are very small, their eggs hardly larger than pigeons' eggs. I was surprised to notice no dogs, while in the northern desert every household has a dog.

The question arose for us : Where to go from In-Salah—which way to return northwards? I had hoped to make a trip into the mountains of Moudir, outlying hills of the great zoologically unknown mountain-ranges of the Hoggar or Ahaggar, the stronghold of the Touaregs. There would have been no difficulty from the point of safety, but we decided not to do it. All round In-Salah everything was dry and dead. Where Rohlfs, in 1864, found everything green, and constantly talks of "Dhomran-forests" (a most misleading expression, as Dhomran grows only to a height of two or three feet at the very utmost!), all around and far eastwards of Tidikelt not a single green plant is seen at present. It is certain (from informations of Arabs and French officers) that at present 100 kilometres south and east of In-Salah not a green leaf exists outside the oasis, and that to the south no pasturage to speak of can be found nearer than 150 kilometres. Moudir itself is very dry, and it cannot be expected that the animal life there differs appreciably from that of the mountains near Ain Guettara, etc.

Therefore a hurried trip to Moudir, at that time, which might have endangered the lives of our camels, seemed to be of very little use at all. It would have been different if we could have gone into the great Hoggar mountains; but this was not possible, as neither Mr. Hilgert nor I could stay away so long. Also the journey to Timbuktu was out of the question, because from Timbuktu it would have taken us a long time to reach Europe again, and the expenses (the return of our men) would not have been in proportion to the undertaking. The country south of Tidikelt, especially the Tanezrouft, is exceedingly bare and lifeless, and at Timbuktu itself, which must be very interesting, we could not have stayed long enough to do any proper work. We therefore decided, after some excursions in the near neighbourhood and oases, to return to El-Golea, and to go thence to Ghardaïa. Thus we avoided the uninviting, toilsome way from El-Golea to Ouargla, and the (in summer) very unhealthy oasis of Ouargla.

While at In-Salah we had a pleasant surprise through the return of Captain Charlet from Rhat, on the frontier of Tripolitania. Captain Charlet had made the journey to Rhat and back, on mehari, and was received by the kaïds and people of In-Salah, and the soldiery. In the evening Camp Bugeaud was *en fête*.

\* Formerly, horses were numerous, and their disappearance has probably two causes: the shifting of the commerce since the French occupation, and the drought of the last twenty years.

There were theatricals (the sous-officiers being the actors), tombola, music, and refreshments in the house of the Commandant, Monsieur Payn. Such a night, in the middle of the Sahara, will never be forgotten by any one who was present.

Besides the French officers and sous-officiers there is a white trader, or rather a firm of three partners, in In-Salah. One of them, Monsieur Brand, is a great traveller, having visited Air (Asben) and Kano. It was most interesting to me to hear of Kano of to-day. When I was there, in 1885, few Europeans had ever seen it, and the journey there was a dangerous undertaking; but now a railway goes to Kano from Lagos on the coast, and at Air is a French post!

No tropical animals occur in Tidikelt; the Hoggar Mountains, from all informations received, are palaeartic, the plateau of Tanezrouft and Afelele bare and lifeless; therefore the tropical fauna can only begin south of the 20th degree, near Air and the northern bend of the Niger. That Air is quite tropical is beyond doubt. Barth described northern Air (Tidik) as rich in tropical plants, the valley of Unân full of luxuriant vegetation, with palms and Talhas (acacias) covered with parasites; the inhabitants kept numerous camels, horses, donkeys, goats, and also cattle; while ostriches, lions, and giraffes were found, and numerous birds, herds of monkeys, and masses of butterflies were observed near Agades (southern Air). Mr. Brand assured me that Air abounded in brilliantly coloured and glossy birds, in lions and gazelles. Ostriches, he said, were not found nowadays nearer than Damerghu, half-way between Air and Kano.

Touaregs, as I have said before, visit Tidikelt in the autumn and winter in numbers. A fine Touareg, with a huge shield and spear, came on a mehari while we were in In-Salah, but left again the same day.

On April 23 we left our hospitable friends, accompanied by some of the officers on horseback, and went as far as Igosten. The way is over hard gravel-soil, with a thin layer of sand recently blown over, and grotesquely shaped hills of hardened soil as "witnesses," as the Arabs call them (*chehood*), of former times; evidently the harder portions have remained as hills and heaps, while the softer soil and sand has been blown (and perhaps partly washed) away (Pl. IX. upper photo).

In Igosten we caught some *Lycaenidae* (*Zizera lysimon*) and a *Cicindela* in numbers. No other butterflies were seen, and of beetles, besides the *Cicindela*, almost only *Tenebrionidae*. Frogs were as common as in In-Salah. Migrants were still numerous, and we noticed three *Turtur turtur arenicola*, one *Caprimulgus europaeus*, a number of *Phylloscopus trochilus*, *Hirundo urbica* and *rustica* (the latter very numerous), *Sylvia curruca*, *Anthus trivialis*.

The next day we travelled 35 km., leaving Foggaret-es-Zoua to our right, and camped in the barest possible spot, where no live plant was seen, though dead Dhomran abounded. In the dead branches of the Dhomran (though I doubt if all had been "Dhomran") a peculiar beetle was collected, and in the evening two Pyralids came to the lamp. The night was cool, the temperature in the early morning only 6° C.

Next day we marched to our old camp in the bed of the Oued el-Abiodh, where "Driu" and other grasses abounded. *Chelidon rustica*, *Turtur turtur arenicola*, a *Phylloscopus*, and *Phoenicurus phoenicurus* were observed.

On April 27 we reached Ain Gnettara again, where we camped two days. Here we came once more across two rare birds: *Ammomanes deserti mya* and

*Oenanthe leucopyga*. There were signs of slight rain having fallen during our absence. We both went out, in various directions, for long hours, to stalk gazelles or Barbary-sheep, but only Hilgert saw game, and shot a buck of *Gazella isabella*. The 27th was a dull day, the sun not coming through before late in the afternoon, and next morning we had some short rain-showers, though only a few large drops each time, not enough to moisten the surface of the ground; but towards the evening a heavy gale set in. The long stalk was, in spite of the negative results, very interesting. I ascended the highest peaks, and found the wildest possible landscape to the south-west, enormous cliffs and deep gorges, and one might have fancied oneself in a big mountain range, above the forest belt, when a thick mist hung over the country in the early morning. The stones are so sharp that one day's walk may hopelessly spoil a pair of boots. The river-beds at the foot of the cliffs on the eastern side contained *Zizyphus*-bushes, those on the western side acacias. No resident Passerine birds were seen in these silent, beautiful oueds, except the *Ammomanes* and rarely a pair of the *Oenanthe*, but of migrants *Motacilla flava thunbergi*, *Muscicapa hypoleuca hypoleuca* (*atricapilla* auct.), *Phylloscopus collybita*, *Chelidon rustica*, and *Turtur turtur* (probably *arenicola*) were observed.

On the following day we entered once more the interesting Southern Oued Mya region. There were, however, now less flowers and verdure, as many plants had ripe seeds and were dried up. Besides, unfortunately, nomads with goats and camels had been there, and much of the small vegetation had been destroyed by them. The *Celerio lineata livornica* as well as its caterpillars had disappeared, and *Pieridae* were less numerous, though a species new to us, *Pieris glauconome*, was caught, and a new *Melitaea*, which we at once recognised as being smaller and paler than *M. didyma deserticola* from the northern Sahara. The first example was seen and caught on April 30th.

What surprised us was the number of migratory birds that were still about, such as *Hippolais pallida opaca*, *reiseri* and *polyglotta*, *Phylloscopus bonelli* and *trochilus*, *Phoenicurus phoenicurus*, *Motacilla flava thunbergi*, *Chelidon rustica*, *Riparia*, *Anthus*, *Lanius senator* and others, and more about this will be said in the ornithological chapter. The nights were as cold as two months ago, and on May 1 we had a minimum of  $+4^{\circ}$  C., while at midday the shade temperature rose to  $33^{\circ}$ . The following night, however, was the last cold night, and after this the temperature never fell below  $12^{\circ}$  to  $15^{\circ}$ .

In the Oued Mya region the Barbary-sheep is common. We saw many traces, and succeeded in shooting a good adult male, not far from Tilmas Djilrhempt.

On May 7 we reached Fort Miribel, passing over the barest stony stretches imaginable. Terrible and bad for the camels' feet as the hammada may be, there is, after all, sometimes a little vegetation in certain deep ravines off the caravan routes. I have no doubt that even the worst hammada would bring forth a bit of verdure here and there if mild rains existed; but rain is exceedingly scarce, and when it comes it falls in torrents and for a short time, so that the water rushes over the rocks down to the river-beds in an incredibly short time.

We were disappointed with our results on the lamps. Besides a few species of Pyralis which occurred in great numbers, we caught rather few Macrolepidoptera, and a good many of those were much worn. Beetles were, however, much more numerous than a month ago.

Rather disquieting was the great number of the poisonous Horned Viper,

*Cerastes cornutus*, which at that time seemed to live entirely on birds—viz. *Motacilla flava thunbergi* and *Phylloscopi*.

On May 12 we camped again in the pretty valley of Okseibat, near El-Golea. Here, as elsewhere, we were struck with the great number of migrants. We still observed: *Caprimulgus ruficollis desertorum*, *Sylvia hortensis hortensis* (*orphea* auct.!), *Hippolais polyglotta*, *Muscicapa striata*, *Saxicola* (*Pratincola* auct.) *rubetra*, *Phylloscopus*, *Oriolus oriolus*, *Chelidon rustica*, *Hirundo urbana*, *Riparia riparia*, and *Motacilla flava thunbergi*. All these birds were undoubtedly still on migration. In a bush of *Nitraria tridentata* we found a nest with young of *Passer simplex*.

On May 14 we entered once more the little Paradise of El-Golea, and took up our old quarters in the house of our friend Lieut. Maire-Séville. The gardens were full of apricots and mulberries, and a few figs (rather dry) and peaches were also ripe. Needless to say, we enjoyed them more than was good for us, and still more, perhaps, the lovely swimming-bath under the fruit-laden trees in the officers' gardens.

The gardens were still full of birds of passage. The Scops-owls had left, though a single pair or two had remained, evidently to breed. Turtle-doves, Flycatchers, Whinchats, *Hippolais opaca*, *Sylvia hortensis* (*orphea* auct.), *Lanius collurio* and *senator*, Orioles, *Phoenicurus phoenicurus*, *Sylvia communis* (*cinerea* auct.), *Sylvia borin*, all three Swallows, *Phylloscopus sibilatrix*, *Muscicapa collaris*, *Motacilla flava thunbergi*, *Caprimulgus ruficollis desertorum*, *C. europaeus meridionalis*, *Tringa* (*Totanus* auct.) *hypoleuca*, *stagnatilis*, *ocrophus*, *Ardetta minuta*, *Nycticorax nycticorax*, *Glareola pratincola*, *Hydrochelidon leucoptera*, *Acrocephalus schoenobaenus*. All these birds were certainly on migration, but the following species might have been breeding:

*Agrobates galactotes*—not rare, lustily singing, but no nest found; *Hippolais reiseri*—behaved as if they were at home, and as they certainly breed in Touggourt might have been breeding here as well; *Fulica atra*—seen on the lake, according to the officers staying all the year round; *Circus aeruginosus*—a pair seen on the lake; *Acrocephalus streperus*—common in the reeds; undoubtedly too early for eggs, testicles and ovaries not very much developed; possibly breeding, but we are inclined to doubt whether any of these birds nest at El-Golea, except *Fulica atra*—and of that we have no proof. Even in the case of *Agrobates* and *Hippolais reiseri* it is doubtful, and in spite of all our searching we never saw an old nest, except of Sparrows, which are exceedingly numerous.

On May 18 we left El-Golea for Ghardaia, accompanied for some distance by our kind host and the garrison doctor. It was hot, the thermometer showing a maximum of at least 45° in the shade. We camped in a sandy plain, with stones and patches of bare rock, the vegetation being fairly rich and of the type peculiar to the sandy districts, but without bushes. The "Muka" (*Alaemon alaudipes*) was common, and we found a nest with two fresh eggs. On the following day we marched to the well-kept Bordj of El-Khoua, where we had a great pleasure. Under the roof nested a pair of *Passer simplex saharae*, and we took from the nest five almost fresh eggs. Here began *Euphorbia guyoniana*, and on the first plants seen were caterpillars of *Celerio euphorbiae deserticola*.

Some twenty kilometres after El-Golea the country began to look pleasanter; smooth, almost glossy white rocky ground was covered with sand, generally thinly, but sometimes as thick as four metres, and *Graminaceae* as well as *Retama raetam* abounded. In places the country reminded me of the "Hauts Plateaux," though

Halfa was of course absent. Traces of Bustards and Fennecs were seen, but we searched for them in vain. It seems to me that the original inhabitants of the hammada have been driven away by the sand, while the real fauna of the "Erg" (sand-dunes) has not yet settled here, and that this is the reason for the scarcity of life in this, apparently, charming district. According to our guide, Abd-el-Kader, there was hardly any sand here some eleven years ago, and the state of the telegraph, which connects Ghardaïa with El Golea, where it ends (some posts being buried in sand almost to the top, so that in one place the wire was enveloped), and the obvious recent alteration of the road in some places, speak for Abd-el-Kader's statement, who was several times at his wit's end and did not know where to go; but there was, of course, no possibility of losing our way long, as there was generally a visible road with kilometre stones and we had the telegraph to go by. The latter is a fine piece of engineering, the wire sometimes being spanned over valleys, hanging in the air in great bends, I believe sometimes 300 to 400 metres in one line.

*Passer simplex saharæ* is not rare, and it mostly nests in the "Gmiras" (i.e. stone-heaps like little pyramids, erected as landmarks by which to find the way), though in other places it nests in bushes. We had to cross some high dunes, but all had a base of solid rock. Here and there high cliffs were passed, and *Buteo ferox cirtensis* as well as *Falco biarmicus erlangeri* had nests with young on these rocks.

Almost all the way to Ghardaïa well-built Bordjs are found every 25 to 30 kilometres—well kept, clean, and new. They are a great comfort in the winter and when a sandstorm blows, and in most of them simple Arab food can be obtained from the keeper; in the summer, however, they become so hot that one generally prefers to sleep outside, as the walls, on which the sun has been shining for more than twelve hours, emit such a heat that one cannot sleep, while the air outside is lovely, and gnats do not exist. Good water is found in most, though not all, of these stations.

On May 22, between Hassi Zirara and Oued Saadana, *Sylvia deserti* was found in full song, and a nest with eggs, covered with sand, was found. *Oenanthe (Saxicola) lugens halophila*, our old friend from the northern desert, appeared again; *Erythrospiza githaginea*, *Ammomanes phoenicurus arenicolor*, and *A. deserti algeriensis* occurred; *Alaemon alaudipes* was not rare.

Vegetation in most places was rich and interesting, but now and then stretches of bare hammada were crossed and quite bare valleys with fine mealy sand, where marching was very toilsome. We had now unbroken sunshine from morning till evening, but we did not find it too hot in the open, while during the last two days in El-Golea, and the first days after that place, the sky was overcast and the air close and very unpleasant.

Before Oued Saadana *Gazella leptoceros loderi* was frequently seen; *Passer simplex saharæ* had nests in most of the "Gmiras." Between Oued Saadana and El-Hadadra oueds with much vegetation and large *Zizyphus* bushes occur, and in the latter *Lanius excubitor elegans* reappeared. Vegetation became still richer: in crevices in the rocks grew *Capparis spinosa*, var. *ovata*, with its fragrant flowers, and *Daemia cordata*; coloquints were common on the sand and now had numerous yellow blossoms; and close to El-Hadadra a large and very thick bush, which we had never seen before, appeared in great numbers: *Periploca laevis*, which reaches here probably its southernmost limit.

Butterflies became numerous in suitable river-beds: *Melitaea didyma harterti*, *Utetheisa pulchella* (a moth), and *Tarucus theophrastus* were common on the spiny bushes of the *Zizyphus*, which were now covered with their yellow, sticky little flowers, and a "White" (*Pieris daplidice albidice*) was quite plentiful. On the 24th we caught 70 butterflies, all of four species: the *Pieris*, *Tarucus*, *Melitaea*, and *Papilio machaon hospitonides*.

Migratory birds were still about: on May 24th *Chelidon rustica*, *Muscicapa striata*, and two yellow Wagtails were seen. One after the other of the birds inhabiting the northern Sahara turned up again: *Crateropus fulvus fulvus* and *Cursorius*, north of El-Hadadra, on the 24th; *Galerida theklae carolinac*, *Caccabis petrosa spatzi*, between Oued el-Abiodh and Bordj Gaâ, on the 25th; *Columba livia* and *Circus gallicus*, near Sebseb, on the 26th; *Turtur senegalensis aegyptiacus*, at Metlili, on the 27th.

On Whit Sunday (26th) we camped in the Bordj of Sebseb, a small oasis, founded by Chaamba about a generation ago. Of migrants, *Chelidon rustica*, *Muscicapa striata*, *Sylvia communis*, *Lanius senator*, and *Motacilla flava thunbergi* were observed. *Sylvia nana deserti* was common, and sang lustily in the bushes on the sand-dunes near by, but no nest could be found.

On the 27th we passed the extensive and rich oasis of Metlili, and camped in an oued 24½ km. from Ghardaïa. Round the camp dead *Helic candidissima* were found. Metlili was originally founded by the Beni Mzab, but it is now chiefly inhabited by Chaamba. Here and in Sebseb the wells are built and worked as in Ghardaïa, and there are as many old dry wells as new ones in use. On the 28th we entered Ghardaïa, coming over a rather bare stony plateau. Wonderful is the view of Beni Isguen and the whole Mzab valley from those heights.

We stopped in Ghardaïa until June 2. In the little hotel—very good, except for certain sanitary arrangements—it was sometimes quite gay. A Dutch painter was staying there, Professor Surcouf from the Paris Museum with his wife and a friend came for a couple of days by automobile, and another auto visited the place. Nearly every day a diligence left for Laghonat; we received and wrote letters.

Of birds we observed: One single *Milvus korschun*, one single *Neophron*, *Falco tinnunculus*, with eggs and young, in the ruins of the old Berber fortress above the slaughterhouses, *Turtur senegalensis aegyptiacus*, and *Turtur turtur arenicola* in plenty; a few *Corvus corax umbrinus*, *Lanius excubitor elegans*, *Crateropus*, Grey-headed Sparrows, *Ammomanes deserti algeriensis*, *Oenanthe (Sarcicola) leucopyga*, *Emberiza striolata sahari*, *Athene*, all undoubtedly nesting. Koenig's statement of the (common) occurrence of Goldfinches must be erroneous; anyhow, it is not found at Ghardaïa at the nesting season.

Of butterflies *Teracolus noua* was common, but many were already much worn; *Papilio machaon hospitonides*, *Pieris daplidice albidice*, *Tarucus*, and *Melitaea* were caught, but we searched in vain for *Euchloë*.

On June 2 we left Ghardaïa, marching on the route of Professor Koenig, of 1893, towards Touggourt.

Ghardaïa had been very hot, and we quite enjoyed the first night in camp, 26 km. east of Ghardaïa, with a minimum of 16° C. We had a few large drops of rain in the evening, and saw lightning over Ghardaïa, where we had had very little sun—a rather unusual thing at that time of the year, when the sunshine is mostly unbroken throughout the day.



On the march we saw *Eremophila* (*Otocorys* anct.) *bilopha*, both the common *Ammomanes*, *Caccabis petrosa spatzi*, one *Gyps fulvus*, and a solitary Swallow. On the 3rd we reached the Hassi Rebib, on the Oued Nça. The valley of that river is very beautiful, full of *Zizyphus*, Retam, and gigantic Terebinth-trees, *Pistacia atlantica*, the "Betoum" of the Arabs. At Hassi Rebib is a cistern and a well, nearly a hundred metres deep, with drinkable water. A rich ornithology is found here, as described by Koenig nearly twenty years ago. *Galerida theklæ carolinae*, *Cursorius*, *Caccabis*, *Merops persicus chrysocercus*, and *apiaster*, *Agrobates galactotes*, *Crateropus* and *Lanius* were common; *Corvus corax umbrinus*, *Falco biarmicus erlangeri*, *Circæus gallicus*, *Caprimulgus ægyptius saharae*, *Otus scops scops*, and *Athene* were shot. The commonest bird was certainly the *Crateropus*. Hares were quite common in the river-bed.

Here, on June 4 and 5, and at Guerrara on the 6th, migrants were still observed in some numbers, and for the last time; the reason for this, however, may be the eminently suitable place—viz. a fertile plain with water, trees, and many insects, and very few enemies. It is, therefore, by no means probable that June 5 and 6 were the last days when migrants stayed here; on the contrary, I believe that some of them lingered here still longer, and most likely some of them did not breed this year and stayed behind in Africa altogether. The following undoubted migrants were observed: *Muscicapa striata* several times; *Phoenicurus phoenicurus*, a single female, probably not quite fit; *Lanius senator*, a single male; *Motacilla flava thunbergi*, a single female, quite tame; *Hirundo urbica* and *Chelidon rustica*, several of each round the wells. In Guerrara, on the 6th, Swallows, Martins, and the northern Yellow Wagtail (*M. f. thunbergi*) were noticed.

We saw no butterflies except the *Tarucus theophrastus*, and, though we caught a fair number on our lamp, we were rather disappointed in the Heterocera. Small beetles came in masses to the light.

The smaller vegetation was mostly "passée," hardly any small flowers being found, though *Pistacia*, *Retama* and *Zizyphus* were in bloom. Probably the Oued Nça would be a remarkable place for moths a little earlier in the year, and again in the autumn, supposing the year to be a normal one.

On the 6th we travelled as far as Guerrara, the last M'zabite town, all of which we had now seen. We got fairly comfortable quarters at a house belonging to the Kaïd, though they were not free from *Pediculus vestimenti*. In the evening we were invited by the Khalifa of Guerrara, who entertained us in the absence of the Kaïd. We ate the best Arab dinner I have ever tasted—soup, "couscous," vegetables, sweets—and I enjoyed very much the company of the noble-looking, courteous, and tactful Khalifa and the "instituteur" (schoolmaster), a typical M'zabite, but highly educated, talking very good French, and being full of advanced and tolerant views.

Guerrara is a very picturesque town on a hill, surrounded by a wall, and with extensive palm groves. West of it is a large sebcha, which was now quite dry. The inhabitants are mostly Beni Mzab. The water is not very good. I found the gardens rather uninteresting—mostly nothing but palms, some pomegranates and figs, very few vines. There were in the gardens—doubtless all nesting—*Turtur turtur arenicola*, *Turtur senegalensis ægypticus*, *Upupa epops*, Kestrels, Grey-headed Sparrows, *Lanius excubitor elegans*. Over the town, in the evening, two Swifts were seen, and on a house *Oenanthe leucopyga*.

Next morning *Apus murinus brehmorum* was shot among the rocks east of the town, where they nested, together with *Oenanthe leucopyga*. We travelled to the well of Sidi-Mahmoud, which, however, has very bad, brackish water, hardly drinkable, and better avoided. On a sort of plateau, near some stony hills, where the soil was sandy but covered with many flat stones, *Eremophila (Otocorys) bilopha* and *Rhamphocorys clot-bey* were encountered, and we were able to collect young in first plumage of both.

On the 8th we reached the great sand-plain of El-Arich, where we camped in a lovely place, without water. It is all sand (but no dunes), with large bushes of *Retama raetam*, *Drin (Aristida pungens)*, *Dhomran (Traganum nudatum)*, and many other plants. This place is a real El-Dorado for an ornithologist, *Sylvia nana deserti*, *Scotocerca inquieta saharae*, *Alaemon alaudipes*, *Ammomanes phoenicurus arenicolor*, *Galerida theklae deichleri*, *Caprimulgus aegyptius saharae*, *Cursorius* being common. Unfortunately, however, it was too late for us: they all had young, and the old birds had such a worn plumage that they were of little use for comparison. We found **many** nests of *Sylvia nana deserti*, but all empty, the young flown out, or with naked young; in one nest, however, two addled eggs were found with two young birds. The number of eggs is three to four.

A rare lizard, *Agama tournevillei*, was common, and replaced the ordinary *Agama inermis* of the hammada. A large Buprestid beetle, *Jalodis deserticola*, was common on the Retam, and so were cases with nearly full-grown caterpillars of *Amycto murina mauretunica*. Under the circumstances we did not stay more than a night, and proceeded to El-Alia, a little oasis among low sand-dunes, at the foot of some stony hills. It reminded us a good deal of El-Oned, with its palm groves and village, half buried in the sand, but some large, fine buildings were visible in the distance, the seat of a rich "Marabu," the successor of the hundred-year-old Marabu who died some fifteen years ago. A hot and strong south wind was blowing, and we had an anxious night, our tent hardly withstanding the force of the gale. *Apus murinus brehmorum* and *Passer simplex saharae* were observed.

The palms are here grown in a peculiar manner, being planted each in its own deep hole, so as to reach down to moist soil.

In the morning the Marabu sent us coffee, milk, and little cakes, with kind wishes for the journey. After crossing some dunes we came into a long and uninteresting sebcha, then again into sand with enormous bushes of *Limoniastrum*; and here, in the middle of sand and nothing but sand, *Ammomanes phoenicurus arenicolor*, which is generally a bird of the hammada if not too barren, was common, side by side with *Galerida theklae deichleri* and *Caprimulgus aegyptius saharae*. We camped at a well called "Hassi Dinar," with a small quantity of very bad, brackish water, and had another night of sirocco, the sand, of course, blowing thickly through the air.

On the 11th we reached Bledet-Ahmar, but we came from the west and did not see our former camping-place. We occupied some forsaken buildings on top of a hill, said to be the property of a Sheikh. Near the village was still a large sheet of water where *Charadrius alexandrinus* were common, old with full-grown young.

On the 12th we entered Touggourt, passing through slippery sebcha and through the town of Temacin, where we saw, for the first time since leaving Ouargla, Red-headed Sparrows.

In Touggourt we stopped only two days. We found that nobody wanted camels, so we left them in charge of Monsieur Henry Chazelles, to be sold in December, and we took the diligence to Biskra, sending the caravan on in charge of the trustworthy Ahmed-ben-Naïli.

While at Touggourt it struck me as remarkable that there were hardly more flies than four months ago, and certainly much fewer than in April 1909, when we were told, that what we saw was nothing compared with the plague of flies in autumn. We were now informed that the flies diminish greatly in the summer, but only to come out in renewed force in September and October. This seems to be a parallel case to that of the irritating sand-flies, *Leptoconops kerteszi*, which were a serious plague in Ourir in February, while not a single one was noticed there in June. Flies are, of course, numerous in the Sahara, to such an extent that in many oases, at certain times, one cannot live in peace during the daytime, except in perfectly darkened rooms. They are, naturally, most plentiful in the oases, but there are also plenty near wells and old resting-places, and they travel with the caravans in great swarms, many perishing and being blown away by the wind on the march, until new ones are picked up in another oasis.

While I was occupied with paying off most of our men, and other business matters, I sent Hilgert to explore the oasis, and he observed the following birds breeding among the palms, and no others: *Turtur turtur arenicola*, *Turtur senegalensis aegyptius*, *Falco tinnunculus*, *Lanius excubitor elegans*, *Hippolais reiseri*, Sparrows, and, on houses, *Chelidon rustica* in small numbers.

The diligence took us to Mraïer, where we stayed most of the day, observing in the oasis both species of Turtledoves, *Hippolais reiseri*, and Sparrows.

During the second night we drove to Biskra, seeing a number of *Caprimulgus aegyptius* in the dusk and early morning. It began to dawn when we changed horses, for the last time, at Bordj Saada, and the most glorious sunrise ever seen—the sun coming up over the Djebel Amarkhaddon in the east and colouring with ever-changing tints the sky and the range of the Djebel bou-Ghezal in the west—ushered us into dear old Biskra, where we found comfortable quarters in the “Hôtel des Zibans,” most of the other hotels being closed in June.

We took pains to find out which birds actually remained to breed in Biskra, and for this purpose we made several excursions into the oasis and gardens, as formerly we had never stayed late enough to be quite sure. We found the following species only nesting in Biskra: both species of Turtledoves; Kestrels; *Otus scops*, and (on the river-banks) *Athene noctua saharæ*; *Apus murinus brehmorum*—sometimes seen in great numbers, though we did not find a breeding-place; Sparrows in very great numbers; *Carduelis carduelis africana* fairly common, but not in very great numbers; *Turdus merula mauretanicus*; *Parus caeruleus ultramarinus*, not rare; *Hippolais reiseri*, by no means rare. *Serinus* was absent, though we saw it commonly in winter. It is evidently only a winter visitor, and breeds farther north.

On the 20th we bade adieu to Biskra, on the next morning arrived in Alger, and on June 27 I reached Old England and Tring, my home.

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## II.

## MAMMALS.

By OLDFIELD THOMAS.

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THIS collection was made by Dr. Hartert and Mr. Hilgert during an expedition southwards to Tidikelt, in the centre of the Western Sahara, a region hitherto entirely uncollected, at least so far as Mammals are concerned. Considering the difficulties of the country and the fact that Birds and Insects were their chief object, the collection of mammals is of remarkable extent, and gives a good idea of the Fauna of the country.

This proves, however, to be disappointingly similar to that of the Northern Sahara, only one mammal, the Gundi, being distinct enough to need description as new. The others are all known desert animals, some described by Lataste from the region between Biskra and Ghardaïa, and others wide-ranging forms extending even into Egypt.

No sign of an admixture of Ethiopian forms occurs in the collection, the animals being all typical N. African species, only differing—when they differ at all—from their Algerian relatives by their greater adaptation to a desert life—this adaptation being generally in paler colour and larger ears.

Mention has here also been made of a few species collected in former years by the Hon. Walter Rothschild and Dr. Hartert in Algeria.

Mr. Rothschild has been good enough to present to the National Museum most of the animals collected, and these form a most valuable accession to the Museum, which had not previously possessed any mammals from the Sahara south of Biskra.

1. *Asellia tridens* Geoff.

♂ 41, ♀ 42; El-Golea. (Also some in spirits.)

Paler than ordinary Egyptian specimens of *A. tridens*, but equalled in this respect by a few exceptional individuals from that country.

[Many hundreds of this bat were found in one of the semi-subterranean forsaken houses among the ruins of the ancient Zenata fortress on the hill above El-Golea. This was the only place where we met with the species.—E. H.]

2. *Plecotus christiei* Gray.

♀ 22; Oumash, near Biskra. (W. Rothschild and E. Hartert.)

Agrees with Egyptian specimens in the size of the bullae, which are far larger than in the European *P. auritus*.

3. *Pipistrellus kuhli* Kuhl.

♂ 4; El-Golea.

♂ 45, 46, 47; 50 km. south of Ghardaïa.

Specimens of this common bat were also obtained at El-Kantara and Biskra.

[These Bats sleep in houses, and begin to fly about fairly early. We found them very common at El-Kantara and Biskra as well as in El-Golea, also in the Bordj of the little oasis of Sebseb, 50 km. south of Ghardaïa.—E. H.]

4. *Myotis oxygnathus* Monticelli.

♂ 7, ♀ 8; Djebel Taya, N. Algeria. February 1911. (Also some in spirits.) (W. Rothschild and E. Hartert.)

It is probable that all specimens from N. Africa hitherto referred to *M. myotis* (*Vespertilio murinus* of Dobson and earlier authors) are really referable to the smaller species described from S. Italy by Monticelli.

[This Bat inhabits a side-chamber of the great cave on Mount Taya, east of Constantine. This is the Bat mentioned by Kobelt, *Reiseerinnerungen aus Algerien und Tunis*, p. 285, which Herr von Berlepsch "had recognised as a new species, but not yet—in 1885—described." Doubtless this was an erroneous statement, for "Herr von Berlepsch" (*i.e.* Freiherr Hans von Berlepsch, who was at that time staying at Hammam Meskoutine), had no knowledge of Bats, and could never have intended to describe it.—E. H.]

5. *Fennecus zerda* Zimm.

♀ 5; 27 km. south of El-Golea.

Agrees closely with a specimen from the Natron Valley, N. Egypt, except that the bullae are smaller. Another specimen from Algeria in the Museum collection, however, has the same large bullae as Egyptian examples, so that this character would seem to be variable.

[The Fennec is entirely restricted to the sandy desert, and especially to the dunes, where they are not entirely without vegetation. It does not seem to occur near Biskra, or anywhere north of Touggourt. We have seen the traces as far south as the Erg between Hassi Meksa and Oued Saret. Near In-Salah it does not seem to exist, although there is plenty of sand. It seems to be fond of beetles.—E. H.]

6. *Gerbillus pyramidum* F. Cuv.

♀ 14; Igosten, near In-Salah.

♂ 19, 21, ♀ 20, 22, 23, 28, 29; In Salah.

Very much like the brighter coloured of the Egyptian specimens in the Museum, but not so bright as those from Tripoli which formed the basis of my *G. pyramidum tarabuli*.

[These little beasts were brought in in numbers by boys, who obtained them in the "gardens," or better palm-groves of the oasis.—E. H.]

7. *Gerbillus gerbillus* Oliv.

♀ 6; 27 km. south of El-Golea.

♂ 16; In-Salah.

♂ 32, ♀ 31; Oued el-Abiodh, near In-Salah.

♂ 38; 30 km. south of Fort Miribel.

Quite like typical Egyptian *G. gerbillus*.

8. *Dipodillus campestris rosikae* Thos.

♂ 15, 16, 24; Chetma, near Biskra. (W. Rothschild and E. Hartert.)

♂ 3, ♀ 43; El-Golea.

♂ 8, 9; Fort Miribel, 138 km. south of El-Golea.

♂ 15; Igosten, near In-Salah.

♂ 17, 18, ♀ 24, 25, 26, 27; In-Salah.

The specimens of this group from the Algerian Sahara are less vividly buffy than those from Tripoli which I named *D. dodsoni*, but I think that they will be found to grade into each other. The majority are also smaller than *D. dodsoni*, but No. 8 from Fort Miribel is as large as most Tripolitan specimens.

[This form was first described from specimens brought in by Arabs at Biskra in 1908, where at that time Mr. W. Rothschild, myself, and Mr. Steinbach collected mammals, chiefly for the sake of fleas, for the Hon. N. Charles Rothschild.—E. H.]

#### 9. *Dipodillus garamantis* Lat.

♂ 13; Chetma, near Biskra. (W. Rothschild and E. Hartert.)

♂ 37; 60 km. south of Fort Miribel.

Type locality, Ouargla.

#### 10. *Meriones schousboei* Loche.

♂ 2; half-way between Ouargla and El-Golea.

♂ 34 (young); 50 km. north of Ain Guettara.

[The Arabs called it "farr" or "djerd."—E. H.]

#### 11. *Psammomys algericus* Thos.

♂ 28-29; Tilrhempt, between Laghouat and Ghardaïa. (W. Rothschild and E. Hartert, 1911).

[This species is very common near Biskra, where the Arabs call it "djerd."—E. H.]

#### 12. *Jaculus jaculus* L.

(a) ♀ 51; plateau 46 km. east of Ghardaïa.

(b) ♀ 30; Oued el-Abiodh, north of In-Salah.

♀ 40; 85 km. south of El-Golea.

♀ 44; 160 km. south of Ghardaïa.

The three southern specimens (*b*) differ from *a*, and from examples from Biskra—with which the latter agrees—in their paler and more yellowish colour, and by the presence of a distinct whitish ring round the tail proximal to the broad black subterminal band. They agree, however, in both respects so closely with examples from Cairo, the type locality of *J. jaculus*, that it would not be advisable to distinguish them. Whether Loche's *Dipus deserti* from Ouargla is *a* or *b* does not appear from his description, and can only be settled by the examination of topotypes.

#### 13. *Massoutiera mzabi* Lataste.

♂ 48, ♀ 49-50; Ghardaïa.

This striking form of Guudi, discovered by Lataste in 1881, was not represented at all in the British Museum collection until the beginning of this year, when Mr. F. R. Rateliff presented a skin with a broken skull. The specimens with perfect skulls now obtained by Dr. Hartert at the typical locality are therefore of much general interest, besides having been of particular value in the working out of the Oued Mya species next following.

They are entirely confirmatory, if confirmation be needed, of the generic distinctness of *Massoutiera* from *Ctenodactylus*, the ordinary Guudi of Algeria. In colour and general external appearance the two are remarkably alike, the

smaller hands and longer tail of *Massoutiera* being the most obvious distinctions; but the different shape of the feet, as described by Lataste, affords ample reason for considering *Massoutiera* as distinct from *Ctenodactylus*.

*Felovia* again, founded by Lataste\* as a subgenus of *Massoutiera* to contain his *M. vae*, I should consider sufficiently distinct from either *Massoutiera* or *Ctenodactylus* to stand as a separate genus. Besides its grooved incisors it is distinguished by yet another shape of the molar teeth, its skull is peculiarly flat, and its bullae are even smaller than those of *Ctenodactylus gundi*, the bullae being immensely swollen in *Ct. vali*, *Massoutiera mzabi*, and the new species of *Massoutiera* now to be described.

[In habits "*Massoutiera*" does not differ from *Ctenodactylus gundi*. They inhabit rocks with caves and hollows, and are fond of running along ledges and under overhanging cliffs. They come out in the full sunshine, but one sees most of them in the morning and towards evening. We found them generally fairly shy, and they often have the habit of stopping motionless on a rock, and then they are almost invisible, having the same colour as the rocks. One hears sometimes a short squeak, and an apparently excited or angry clicking sound. The tail is frequently jerked up and down, and they frequently sit up like a hamster, holding food between their fore-feet, when eating.

We found *Massoutiera mzabi* only in the Mzab country, in the neighbourhood of Ghardaïa, and saw it once about 50 km. south of the latter town. The Arabs call it "gundi," and do not distinguish between it and *Ctenodactylus gundi*. The latter is common on the rocks near Biskra and El-Kantara, and we saw young ones of various sizes in April.—E. H.]

#### 14. *Massoutiera harterti* sp. n.

♂ 13, ♀ 12; Oned Mya, south of Fort Miribel, about 28° 30' N., 3° E. Alt 400 m.

Like *M. mzabi*, but with larger bullae.

External characters as in *M. mzabi*, the pelage equally fine and silky, and the colour of the same pinkish buff. Tail-hairs longer, though this may be an accidental condition, and the tail itself longer according to the collector's measurements.

Skull very similar to that of *M. mzabi*, but the bullae distinctly larger, the size of the bullae being a characteristic feature of the different species of the group. In the new form the greatest breadth on the bullae is slightly greater than the zygomatic breadth, slightly less in *M. mzabi*; the inflation of the bullae is greater throughout, and their lineal diameter longer (see measurements below). Incisors smooth, without any trace of the groove present in *Felovia*. Molars quite as in *M. mzabi*.

Dimensions of the type, measured in the flesh:—

Head and body 230 mm.; tail "47" (?37, the other specimen 38); hind foot 37; ear 18.

Skull, greatest median length 48·5, greatest diagonal length 51, condylo-incisive length 43·2; zygomatic breadth 30; length of nasals 17·8, interorbital breadth 13; greatest breadth on bullae 31·5; interparietal 8·7 × 11·5; palatilar length 37·8, palatal foramina 7·6; upper molar series (crowns) 8·7; bulla, greatest

\* *Le Nat.* iii. p. 287. 1886.

diagonal horizontal diameter, as seen from above, 18·4; ditto below 19·8; height 17·8.

*Hab.* As above.

*Type*: Adult female. B.M. No. 12. 11. 14. 57. Original number 12. Collected April 8, 1912.

Although the differences between this animal and *M. mzabi* are not very great, they are of importance because of the complete geographical isolation of the two forms. Gundis are inhabitants of rocky ground only, and, unlike Jerboas, Gerbils, and other desert animals, they are unable to pass the barriers presented by the rolling sand-dunes and stoneless areas of the Sahara. The rocky area of the Oued Mya inhabited by *M. harterti* is about 300 miles south of Ghardaïa, where *M. mzabi* occurs, and intergrading specimens are therefore not likely to be found.

With regard to the sizes of the bullae, so important among the Gundis, I may note the following dimensions as occurring in the different forms; the measurement given being the greatest diagonal horizontal diameter as viewed from above:—

<i>Felovia rae</i> . . . . .	12 mm.
<i>Ctenodactylus gundi</i> . . . . .	14·5 „
„ <i>vali</i> . . . . .	17·4 „
<i>Massoutiera mzabi</i> . . . . .	17 „
„ <i>harterti</i> . . . . .	18·4 „

[It was only in the Southern Oued Mya region, and the wild rocks of Aïn Guettara, that we saw this animal, and besides the two examined by Mr. O. Thomas we shot one at Aïn Guettara, which was put into spirits.—E. H.]

#### 15. *Lepus kabylicus* de Winton.

♂ 3; Hammam Meskoutine, east of Constantine. (W. Rothschild and E. Hartert.)

The comparatively dark hare of the northern zone of Algeria.

[This is probably the common hare of the whole "Tell." It was not at all rare near Hammam Meskoutine, but as we were there during the close time we could not very well go out for hare-shooting.—E. H.]

#### 16. *Lepus pallidior* B.-Ham.

♂ 23; 20 km. north-east of Biskra. (W. Rothschild and E. Hartert.)

♀ 1; Kef-el-Dor, Algerian Sahara. (E. Hartert and C. Hilgert.)

The series of hares obtained in Algeria illustrates the gradual modification of the species as the country becomes more and more desert southwards. The hare of the "Tell," or northern fertile region, *L. kabylicus*, is comparatively dark, then follows the present paler and more greyish species in the Biskra region, to be succeeded farther south by the pinkish buff *L. whitakeri* of the Sahara. Widely different as they look from each other, all would appear to be modifications of one animal, as no essential differences in skull or teeth are to be found.

#### 17. *Lepus whitakeri* Thos.

♂ 53, ♀ 52; Oued Nça, east of Ghardaïa.

♂ 7 (young); near Hassi Marroket, 40 km. south of El-Golea.

♀ 10; Sidi-Djilali-Lakhdar (Oued Mya), 180 km. south of El-Golea.

♂ 11, ♀ 36; Oued Mya, north of Aïn Guettara.



There is some temptation to think the more southern specimens 10, 11, and 36 different from those from Oued Nça, their ears being a little longer and their colouring more orange. But a comparison with them of the original skins from Tripoli renders it evident that they cannot be satisfactorily divided on the material at present available. For the Tripoli specimens have the ears of more or less intermediate length, their general colour is more like that of the Oued Nça specimens, while in the detailed colour of the hair-rings (always a doubtful character to use) they more resemble the Oued Mya skins.

The whole series agree in the practical absence of cement from the incisive grooves, by which character they are distinguishable from the otherwise similar *L. isabellinus* Cretzschm. of Egypt.

[These very fine reddish sand-coloured hares with their enormous ears were not rare in the Oued Mya and its tributaries, and quite numerous in the wide, ancient river-bed of the Oued Nça, between Ghardaïa and Guerrara. It was, however, not very easy to shoot hares in the Oued Mya, as they seemed to rest, in the daytime, more among the rocks and stones bordering the river-bed, where one could not easily walk noiselessly, and they were quite shy; during the night-time they came to the Oued, and pulled down the branches of the Retam (*Retama raetam*), of which they seemed to be rather fond. In the Oued Nça hares were so frequent that one often came across them, and could shoot them without difficulty.—E. H.]

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### III.

#### NOTES ON RUMINANTS AND OTHER LARGE MAMMALS.

By ERNST HARTERT.

1. *Gazella cuvieri* Og.—This Gazelle, the "Edmi" of the Algerian Arabs, is common enough in the southern ranges of the Atlas, especially in the more or less bare rocks near El-Kantara, and it never leaves the mountains or their close neighbourhood. It appears to be generally found in the same districts as the Barbary Sheep, but to be absent from the real Sahara, and we never saw or heard of it south of Biskra. Edmi are shy and somewhat difficult to shoot, but can often be approached under cover. (Edmi seems to be a Berber word?)

2. *Gazella leptoceros loderi* Thos.—The "Reem" (Rim) of the Arabs, or "White Gazelle," is essentially a desert animal, being entirely restricted to the Erg or rolling sand-dunes. It is found in the Erg between Biskra and El-Oued, and is common in the Great Western Erg between Ouargla and Rhadames. We found it also among the dunes south of El-Golea, and between El-Golea and Ghardaïa. It is probably found in every Erg of any great extent. Owing to the hilly nature of the dunes and the noiseless walking on the sand, the Reem is easily stalked, and generally killed with shot by the Arabs, who have no idea of sportsmanlike shooting: they often catch the young (with or without the help of dogs), then make it squeak, and kill the mother when coming to the help of her young. In this way, and by waiting patiently for days and nights in ambush, these and other Gazelles are decimated, and they will soon be rare or disappear from all the more or less frequented districts of the northern Sahara.

There can be no doubt that *G. loderi* is the same species as *G. leptoceros*, but it is probably a slightly different geographical race, and I have therefore called it here *G. leptoceros loderi*.

3. *Gazella dorcas* (L.) (or subspecies?).—A Gazelle inhabits the plains immediately south of the southern Atlas (Aurès mountains), also the great plains between Laghouat and Ghardaia, and extends, apparently, into the Chott region. This Gazelle has always been called *G. dorcas*, and no doubt it belongs to the same species as the animal now called *G. dorcas* in the Nile districts; whether it will be found to differ slightly, and form a geographical race, cannot at present be settled, as sufficient material is not available to decide about this question.

Mr. Alfred E. Pease (*Proc. Zool. Soc., London, 1896*) thinks that *G. dorcas* is confined to a belt of 120 or 150 miles wide, south of the Aurès mountains, and that in the more southern Sahara it is replaced by the Reem; the latter, however, a totally different species, is restricted to the sand-dunes, and never occurs in the hammada or clayey desert. Gazelles with curved horns, however, are found far down into the desert, and probably farther south than any Reem, in the hammada and mountains. These Gazelles are very much like *G. dorcas*, but the specimens I brought home appear to be :

4. *Gazella isabella* Gray.—We shot a middle-aged, not very old male near Aïn Guettara, on the southern escarpment of the plateau of Tademaït. Its length, without tail, was 88, the tail 13.5, height at shoulders 57, at rump 65 cm. An old female with very long horns was obtained in the bed of the Oued Saret. We measured its length as 83, tail 14, height at shoulders 55, at rump 62 cm. These specimens are rather brighter, more reddish in colour, than most *G. dorcas*, and the tips of the horns of the male are strongly bent inwards. Mr. Oldfield Thomas said at once that they appeared to be *G. isabella*, and Mr. Rothschild, who kindly compared the specimens with me in the British Museum, came to the same conclusion.

I have no doubt that this is right, but I must confess that the two Gazelles, *G. dorcas* and *isabella*, are very much alike, and that it is very desirable to have series of each for comparison, not only horns! Horns of Gazelles can be bought in quantities in Biskra and elsewhere, and I have seen among them many varieties and some specimens of which it would be difficult to say if they were *dorcas* or *isabella*. Horns which we picked up (on the skulls) north of El-Golea are apparently also *isabella*. Horns of *G. leptoceros (loderi)* are also common on the markets of Biskra and Touggourt.

*Gazella isabella* is not rare along the oueds and among the hills south of Onargla to Aïn Guettara, and apparently to the Oued El-Abiodh, north of In-Salah. It goes about in small flocks or singly, and is in every case very shy. As food is scarce in the hammada, it feeds, as a rule, in the river-beds, where its spoor is often seen very plentifully, but it retires, partially or mostly, to the hammada to rest during the daytime. It is very fond of certain grasses, such as *Aristida plumosa* and *Stipa tortilis*.

For the differences between *G. dorcas* and *isabella* may be consulted: Selater & Thomas, *The Book of Antelopes*, iv. pp. 99-108 and 151-154, plates LVII. and LXIV., also G. S. Miller, *Proc. U.S. Nat. Mus.* 42, pp. 171-172, pl. 15,

where a number of skulls and horns from Jebel Bawati in Nubia are figured and described.

About *Gazella rufina* Thos. (*P.Z.S.* 1894, p. 467, fig. skull), described from a specimen bought in a shop in Algiers, we have no further information, and its habitat is still unknown.

In the *Proc. Zool. Soc. London*, 1911, p. 961, Mr. R. Lydekker described as a new species of Gazelle an animal said to have come from "Algeria, between Constantine and Biskra," under the name of *Gazella hayi*. At a meeting of the Zoological Society on October 29, 1912, Mr. Lydekker pointed out that, "owing to an unfortunate mistake in labelling, the Gazelle described in 1911 as a new species, *Gazella hayi*, was really *G. fuscifrons*" (see *Abstract Proc.* No. 112, p. 1). The latter is the Persian and Baluchistan form of *Gazella bennetti*, and it is curious that the error had not been detected at once.

5. *Gazella mhorr* (Benn.).—This species is, according to statements from French officers, and to our Arabs, common in the Hoggar mountains, and even found in small numbers in the hills of Muidir, belonging to the Hoggar system. We saw a number of horns in In-Salah, and a pair was given me by Commandant Pein. This would doubtless be the typical *mhorr*, described from Morocco, while *Gazella dama* replaces it in Senegambia and *G. ruficollis* in Dongola and Sennaar. The Arabs call it "Mhor."

6. *Addax nasomaculatus* (Blainv.).—The Arabs now call this species variously Meha and Begra-el-Ouach. The latter name has been said to be that of *Bubalis buselaphus* (*bubalis*) by Lataste and others, but it is in Algeria nowadays one of the names of *Addax nasomaculatus*. The Addax is even now not very rare in the Great Eastern Erg between Bir er-Resof ("Bir Beresof") and Rhadames, but it seems to be shifting its quarters according to the pasturage, which entirely depends on the rain; this is from reports of Arabs and French officers, and it must be true, for fresh horns are not rarely brought to Ouargla and thence to Biskra. In 1893 a freshly killed animal was brought in to Ouargla, according to Professor Koenig. During our journey we did not come across any sign of Addax, nor did Mr. Spatz last summer, when he travelled far into the Western Erg to Aïn Taïba and Hassi Melah. Fifty-five years ago Tristram saw an Addax on the Oued Nqa.

7. *Bubalis buselaphus* (Pall.) (= *bubalis* Pall. 1767).—We were unable to find any proof whatever of the existence of the Bubal in Algeria. Nobody knew it; not even a horn could be found, nor could we find any Arab who would profess that he had seen it. The name "Begra-el-Ouach" (= Wild Cow), which, according to former authors, used to be the name of the Bubal, is now used for the Addax, as well as "Meha," though the former appears to be inappropriate, and much better suited for the Bubal.

Shaw (*Travels in Barbary and the Levant*, second edition, 1757, p. 170) described the "Bekker el Wash" as a wild species of cow, which lived in large herds, was of the size and colour of Red Deer, and was apparently then common north of the Atlas, as the south was at that time unknown! Loche described it as being confined to the mountainous districts of the south; and Tristram (*The Great Sahara*,

p. 387) relates that the hunters of the Souf (El-Oued) frequently obtained it. In the British Museum is a young animal obtained by Fraser in the Chott Djerid in Tunisia, in 1846.

All these statements are probably correct and true, but it is to be feared that the Bubal no longer exists in Algeria nor in the Sahara south of Algeria—at least as far as Tidikelt.

It is, perhaps, not astonishing that so large a beast has disappeared, when it is considered that the Lion has been exterminated; in olden times a wild Ass (according to Tristram) inhabited South Algeria; the Deer is restricted to a small portion of the Northern Atlas forests, the Panther and other wild cats have become rare; the Ostrich has disappeared from the confines of Algeria. All this is partly due to the ruthless hunting of Europeans, unchecked by any game-laws, as they used to be; but more so to the persevering and unsportsmanlike killing and catching by the Arabs at all seasons of the year.

8. *Ovis lervia* Pall. (= *Ovis tragelaphus* Desm.).—The “Barbary Sheep” appears to inhabit the mountains of the Southern Atlas ranges, especially south of the “Hants Plateaux,” but it also extends into the Sahara, at least as far as Aïn Guettara, and, according to hearsay, even to the Hoggar mountains. It is, naturally, absent, from the regions of the sand-dunes, from the Chotts and the flat hammada, and is only found among rocks and cliffs, which, however, need not be very high. We saw a very old male at Aïn Guettara, and picked up a skull and horns close by; but we found many traces and droppings in the little affluents and side-valleys of the Southern Oued Mya, and in the latter itself. They come to the river-bed to feed in the evening and during the night, but retire to the rocks for the day. As their colour harmonises so closely with the brown rocks, they are invisible while resting, even to most Arabs. A fine male was shot in the Oued Mya at dusk; its meat was excellent. Our Arabs called this animal always “Laroui,” which appears to be a contraction of “El-Aroni,” and the name “Aoudad” was unknown to them.

9. *Foxes*.—There are at least—apart from the Fennec—two Foxes in Algeria, a larger form living in the Atlas mountains, probably *Vulpes nilotica*, and a smaller one in the northern parts of the Sahara, which is *Vulpes famelica* (Cretzschm., or perhaps a subspecies of the latter. Unfortunately we have not shot any of these (cf. also Lataste, *Actes Soc. Linn. Bordeaux*, xxxix. pp. 212-19). Foxes are said to occur also in the Southern Oued Mya, but we have no proof of it. *Vulpes famelica* occurs also in South Tunisia.

10. *Canis aureus* L.—The jackal is not rare in North Algeria, and even found close to the town of Algiers, and extends as far south, at least, as Aïn Guettara, where we saw its undoubted spoor, and the dung, dropped on top of stones and camel-skeletons, more especially on the stomachs of the dead camels, which were generally full of half-digested food. Lataste (*l.c.* p. 212) says that the jackal never goes south of the Tell and Hauts Plateaux, but this is an error, though it is, naturally, absent from the Erg and Chotts.

11. *Hyaena hyaena* (L.).—Still found, though in small numbers, from the Northern Atlas ranges to Biskra, and, according to statements from Arabs and

officers, near El-Golea. We have not been able to find traces or reports of its occurrence farther south.

12. *Sus scrofa* (? subsp.).—Wild pigs are common in Northern Algeria, but absent from the Sahara. Mr. Rothschild and I took part in a "chasse" near Hammam Meskoutine, in February 1911, when twelve "haluf" were shot, three of which were very old specimens. A pair of them are now mounted in the Tring Museum.

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#### IV.

#### BIRDS.

By ERNST HARTERT, PH.D.

BIRDS were, of course, the principal object of the expedition, and therefore most of our time and energy was spent on the collecting and observation of birds. With more time and luck one will doubtless, at least near Ouargla, find *Bubo b. ascalaphus* nesting in the regions we traversed, but otherwise we do not believe that any resident desert birds have escaped us. The number of migrants can of course be increased, and the best places for them would undoubtedly be El-Golea and In-Salah.

The species which do not breed in the Sahara south of Biskra as far as we passed through it are marked with an asterisk.

Conclusions see at the end of the list of species and subspecies which we observed.

#### [*Corvus corax tingitanus* Irby.

This form is not an inhabitant of the desert, except on its northern edge. In 1912 we saw Ravens near Biskra and a stray bird near Chegga, which must have been *C. c. tingitanus*. We are still uncertain to which form the Ravens of the dayats near Tirlhempt (cf. *Nov. Zool.* xviii. p. 471) belong.]

#### 1. *Corvus corax ruficollis* Less.

(*Corvus umbrinus* auct.)

*Corvus ruficollis* Lesson, *Traité d'Orn.* p. 329 (183.—No locality; Pucheran, *Rev. & Mag. Zool.* 1853. p. 548, says that the type came from the "Cape," but it more probably came from the Cape Verde Islands; in any case the description can only apply to the present species, and the name must therefore be used).

*Corvus umbrinus* Sundevall, *Oef. k. Vet. Akad. Förel.* Stockholm, 1838. p. 199 (Sennaar).

*Corvus infumatus* Wagner, *Münchener gel. Anz.* viii. p. 301 (June 1839.—Egypt, Nile-Delta).

This form of Raven is the Raven of the desert from Egypt to Algeria, and doubtless also of the unexplored south of Morocco, as it is found on the Cape Verde Islands.

At a distance the desert Raven cannot be distinguished from *C. corax tingitanus*, but we have no doubt that all the Ravens seen between Touggourt and El-Golea, south to the plateau of Tademaït, those at Ghardaïa, and all the Ravens nesting on the Terebinth-trees in the Oued Nça, are *C. c. ruficollis* (= *umbrinus*). In fresh

plumage these Ravens are nearly as blackish as *C. c. tingitanus*, but they can always be distinguished by the slenderer, less arched beak, and the much greater distance from the nostril to the tip of the culmen, and from the end of the nasal bristles to the tip. By this character even young birds might be distinguished; in the specimens in the Triug Museum the outer aspect of the wings is also much more bluish in young *tingitanus*, more greenish in *ruficollis*, but I am not sure if this will hold good.

Like other Ravens, these birds nest partly on cliffs, partly on trees.

As I have said above, all desert Ravens from the Cape Verde Islands to Nubia, and also those from Arabia, are the same; they extend even farther eastwards, but about the eastern limits and allied eastern forms we are as yet somewhat uncertain.

The following measurements might be interesting :

5 Cape Verde specimens have wings of 370—390 mm.

♂ south of Ouargla (Graf Zedlitz in litt.): 394 mm.

2 ♀ ♀ ad. south of El-Golea : 367, 368 mm. (all males either young or very much worn, so as not to be measurable).

3 ♀ ♀ S. Tunisia (Erlanger coll.): 370—377 mm.

8 Nubian and Egyptian birds : 380—420 mm.

3 ♂ ♂ ad. Lahadj, S. Arabia (Erlanger coll.): 392—393 mm.

♀ Lahadj, S. Arabia (Tring coll.): 357 mm.

♂ Aden, British Museum : 396 mm.

E. Persia (Saraduy coll.): "♂ ♂" 384, 395, 411 ; "♀ ♀" 400, 401 mm.

But in Persia other gigantic birds occur, which I have united with *C. corax laurencei*; more material is, however, required to fix the latter form and its distribution.

#### [*Pyrrhocorax pyrrhocorax* (L.).

None of the cliffs and mountains we came across in the desert are inhabited by the Chough, and it seems not to occur south of El-Kantara, Djebel Amarkhaddou, and the Bou-Ghezal range.]

#### 2. \**Oriolus oriolus oriolus* (L.).

Cf. *Nov. Zool.* xviii, p. 474.

A very late migrant; females noticed in the bed of one of the affluents of the Oued Mya on May 6, in the bed of the Oued Saret on May 8, and in the gardens of El-Golea from May 14 to 16. Strange to say, however, we did not see a single fully adult male.

#### [*Carduelis carduelis africanus* (Hart.).

We never saw a Goldfinch in the desert. Neither in April 1911, nor this year, in June, was a single specimen seen, in spite of special observation in or near Ghardaïa. Koenig (*Reisen u. Forsch. Algerien*, p. 127) says that on April 19th Goldfinches were common in the oasis of Ghardaïa, but I am afraid this must be a *lapsus calami*, as we did not see any there, and at that time they must have been breeding; moreover, in the ornithological detailed part, p. 316, the author mentions only the Ziban oases (*i.e.* the oases near Biskra) as the southernmost places where he found these birds.

In Biskra they are a breeding species, and we saw young birds late in June.]

[*Carduelis cannabina* (L.).

Though common in winter as far south as Biskra, it does not breed there, or we should have seen specimens in the oasis in June. The birds visit Biskra in winter only, and they belong probably partially to *C. cannabina cannabina* and partially to *C. cannabina nana*. Cf. *Nov. Zool.* xviii. p. 476.]

[*Serinus canarius serinus* (L.).

The Serin-finch does not extend into the Sahara, though it is common in winter in the oases along the foot of the southernmost Atlas ranges, as for example in Biskra and the other Ziban oases, and in Laghouat. Koenig and ourselves thought it was breeding at Biskra, but this year we searched in vain for a sign of the species in June; if it had been there, we should undoubtedly have heard and seen it. In 1911, at Laghouat, we noticed flocks on April 10, but none were noticed in the gardens eighteen days later. We are therefore now convinced that Serins are only winter visitors and do not breed in Biskra (nor in Laghouat).]

3. *Erythrospiza githaginea zedlitzi* Neum.

*Erythrospiza githaginea zedlitzi* Neumann, *Orn. Monatsber.* 1907. p. 145 (Algeria and Tunisia, type Biskra); Rothschild and Hartert, *Nov. Zool.* xviii. p. 477.

The "Trumpeter" extends in small numbers far south into the Sahara.

For the first time we saw a small flock and shot a male on some stony, rocky "gour," about half-way between Touggourt and Ouargla, on March 6, north of Arefdji. In the rocks along the banks of the Southern Oued Mya we saw twice one or two specimens, but only succeeded in shooting a single male with very little red, looking almost like a female, on April 30. Also among the rocks of the Mزاب country, between Ghardaïa and El-Golea, we once saw this bird, but it was always very shy and difficult to obtain. The old male shot on March 6 is a typical *zedlitzi*, wing 89 mm., while the other, apparently younger one, with a wing of only 86 mm., resembles more eastern *githaginea*. Cf. *Nov. Zool.* xviii. p. 477.

## 4. The Sparrows.

Cf. *Nov. Zool.* xviii. pp. 479-82.

One of the questions in which we were particularly interested was, how far to the south Sparrows might be found, and to which form they belonged.

While at **Touggourt** we collected nineteen males; fifteen of these are of the bastard race called "*Passer flückigeri*," which resembles the Italian Sparrow, *Passer italiae*, having an entirely chestnut crown and no lateral black stripes; three have the same chestnut crown and lateral stripes, so that they must be called *hispaniolensis*, and one has the feathers of the crown black with wide brownish mouse-grey edges, and might thus be named *Passer domesticus tingitanus*, with a great amount of black to the crown-feathers.

In passing through **Temacin** only chestnut-headed males were observed.

In **Onargla** Sparrows were common. Of the fourteen males we collected nine have entirely chestnut crowns, four a slight admixture of black or dark grey, one a quite grey crown; not one has lateral stripes. The Sparrows nest here on houses and in date-palms and other trees.

No Sparrows were observed until we came to **El-Golea**, where they were exceedingly common, breeding in palms in the oases, and especially numerous in

the huge eucalyptus-trees in the officers' gardens, but also on buildings. All the twenty-seven adult males we brought home are grey-headed, with the black bases to the feathers well developed, and only three of them show a slight admixture of chestnut in the grey crown.

Sparrows were of course absent from the uninhabited desert, but in the **Tidikelt** oases they were common again, though not so numerous, it would seem, as in El-Golea. We skinned twenty-five adult males in Igosten and In-Salah, and all these were grey-headed, mostly with very distinct black bases to the crown-feathers, sometimes with much black, so that in two specimens nearly the whole crown is black. No hybrids or *Passer hispaniolensis* were found.

Comparing the series from In-Salah and Igosten with that from El-Golea, it is evident that the feathers of the back are more edged with chestnut than with brownish buff, as in the El-Golea series and in other southern Algerian Sparrows generally. The paler, more brownish buff edges to the feathers of the back, are apparently due to the mixture with *Passer hispaniolensis*, which has cream-coloured streaks on the back, while they are generally more chestnut in *P. domesticus domesticus* and northern *P. domesticus tingitanus*. These differences between the various grey-headed Saharan Sparrows are, however, not constant, and we can, at present, only call them

*Passer domesticus tingitanus.*

The hybridisation of *P. domesticus (tingitanus)* with *P. hispaniolensis*, which is so complete in many places in Algeria, is apparently not so advanced in Morocco; we have received series of Sparrows, collected by Riegenbach, from Mazagan, Mogador, and Shishawa, ten hours from Marrakesh, and only a few specimens (Mogador: like "*flückigeri*," Shishawa) show the mixture with *hispaniolensis*, yet from Marrakesh came the type of "*Passer ahaser*."

In El-Golea (March and May), and in In-Salah (April) numerous eggs and young were found at the same time. The eggs vary exactly like those of *P. domesticus domesticus*, and the clutches range from three to five, those of only two eggs being apparently incomplete.

### 5. *Passer simplex saharæ* Erl.

(With regard to the distinctions between *P. s. saharæ* and *P. s. simplex* we are as yet no more advanced than last year, as no fresh Nubian specimens are available, but it seems that slight differences exist between the two supposed races. Cf. *Nov. Zool.* xviii. p. 482.)

Coming from Tougourt we first came across the desert Sparrow south of Bled-el-Ahmar, about 40 km. south of Tougourt, and afterwards we found it in almost every suitable locality. Such places are sand-dunes or sandy plains with the vegetation typical for the sand-dunes, provided that there are nesting-places, which are of the most varied description. Specimens were shot at Safet Iniquel, about 26 km. north of El-Golea, at Hassi Okseibat, Hassi Marroket, and south of El-Meksa, in the great Erg-bent-Chaouli. Farther south we did not see these birds, and at In-Salah—where we should have expected some—and in the Southern Oued Mya we found no trace of *Passer simplex*. These sparrows were most common in the Ergs north of El-Golea. In the latter district nearly all the nests were found in "Gmiras," *i.e.* smaller or larger stone pyramids, erected as landmarks. Other nests were built in the stone walls of deserted temporary buildings, in the stone walls protecting the entrance of a well, on a rafter under the roof of a "Bordj," in a bush of *Retama raetam* (once), and in thick bushes of *Nitraria*



*tridentata* (twice—see plate). In 1909 I found a nest in a low date-palm, while Koenig discovered several in the stone walls of wells.

On March 28 Ahmed ben-Saya found a nest with five fairly hard-set eggs, of which he broke one. The four remaining eggs are rather light, three being of a pale cream colour with pale brownish grey patches and spots of varying sizes, the fourth white with similar but more pronounced and more compact patches, and underlying paler ones.

They measure  $19.2 \times 13.9$ ,  $19.2 \times 13.6$ ,  $19.4 \times 13.9$  and  $19.6 \times 13.9$  mm.

On May 19 I found a nest under the roof, on a rafter, of the Bordj El-Khoua, north of El-Golea. It contained five dark-coloured eggs, only one being lighter, with the whitish ground-colour visible between the numerous large dark brown blotches; the other four are pale chocolate with chocolate patches and spots. They were about half incubated, and measure  $19.8 \times 13.9$ ,  $19.9 \times 13.9$ ,  $19.5 \times 13.5$ ,  $19.8 \times 13.9$ , and  $20 \times 13.8$  mm.

On May 12 and 13 one addled egg each was found with half-grown young, in "Gmiras"; one is chocolate, the other whitish with pale ashy markings; they measure  $18.3 \times 14.1$ , and  $18.5 \times 13.75$  mm.

On May 12, 22 and 23 young desert Sparrows, some quite young and naked, some ready to leave the nest, which flew away when one opened the nest up, were found. They are of the colour of the old female, on the upper side sand-coloured, and without the black throat of the adult male, both sexes being alike.

The number of eggs and young varies very much, as we found twice only one single naked young bird in the nests, once two, but mostly three to five eggs or young.

#### [*Emberiza palustris palustris* Savi

A specimen of this bird (perhaps not subspecies of *pyrrhuloides*!) which I examined was shot among the reeds of the Oued Biskra, near Biskra, 22. ii. 1905, by Mr. Ussher, and is now in the Dublin Museum.]

#### 6. \**Emberiza hortulana* L.

Cf. *Nov. Zool.* xviii, p. 483.

An adult male was shot—evidently on migration—on April 10, 30 km. north of Aïn Guettara, and another bird apparently of this species was seen near that place.

#### 7. *Emberiza striolata sahari* Lev.

Cf. *Nov. Zool.* xviii, p. 484.

We did not find this bird in the Southern oases, but it was very common round about Ghardaia. According to Rohlfs (*Reise durch Marokko*, 1869) this bird is common in Tafilet and other oases south of the Moroccan Atlas, where it is called "Bou-Shamm," *i.e.* "father of fat," but it is not found in Tuat and Tidikelt.

#### 8. *Rhamphocorys clot-bey* Bp.

Cf. *Nov. Zool.* xviii, p. 484.

We had hoped to find this interesting Lark in many places of the Hammada, but we only came across it twice, near Bordj Chegga, where a small flock was seen in February, and again on June 7, east of Guerrara, in the Mزاب country. It was on a sandy plain with numerous flat stones, and a few stony hills near by. There were two flocks of young birds, being led by their parents, and one or two

single old birds. The young were nearly as large as their parents, but the bill much smaller, with the cutting edges nearly smooth; the feathers of the back had very indistinct ashy tips, the sides of the head had no black and were of a reddish sand-colour, throat and abdomen creamy white, breast and sides sandy buff; instead of the black markings of the adult bird on the underside there are only indications of two dark patches on the throat, the slaty bases showing through, and a few indistinct slaty spots on the sides of the throat; the secondaries are pale cinnamon rufous; the primaries have wide and sharply defined cinnamon-buff tips, the ends of the secondaries are pale cinnamon-buff, not pure white and less wide; rectrices less sharply marked. Old and young were heard to call "djüp, djüp, djüp, djüp, djüp," somewhat plaintively; and an old bird, while searching for its young, called loudly hüht and tiiiiiiiiiiii, only a few yards from me.

9. \**Calandrella brachydactyla brachydactyla* (Leisl.).

Cf. *Nov. Zool.* xviii. p. 485.

The first specimens were seen on March 7 and 8, north and south of Ngoussa, north of Ouargla. Henceforth flocks of five or six to twenty or thirty were seen to March 28 (El-Golea). After that we saw them only sporadically.

A number were running about in the Oued Saret, 108 km. south of El-Golea, on April 3; small flocks were observed on April 9 and 11; one being shot was so damaged that we did not preserve it, but a note was made that it belonged to the rufous-headed, sandy Algerian form.

Koenig mentions this species from west of Guerrara, where he saw it singly and in pairs on April 24. We believe that we saw examples east of Guerrara in June. This would be the southernmost breeding-place in this part of Algeria.

10. \**Calandrella brachydactyla longipennis* (Eversm.).

Hartert, *Vög. pal. Fauna* i. p. 216; *Nov. Zool.* xviii. p. 486.

In the Oued Saret, on April 3, two short-toed Larks, both females, were shot; one of these is a typical sandy rufous-headed Algerian bird, while the other is greyish, and agrees with the eastern form, *C. b. longipennis*. The wings (right and left) measure 88 and 89 mm., i.e. just as long as in the specimen of *Calandrella brachydactyla brachydactyla* shot in the same place. The wings of *C. b. longipennis* are, as a rule, not 3 to 5 mm. shorter (as stated in *Vög. pal. Fauna* i. p. 216), but equally as long, or a few millimetres longer.

This is the third specimen of the eastern form known to us from Algeria.

(*Calandrella minor* was **not** found in the Sahara, though possibly it might be in or near the Oued Nçā.)

11. *Ammomanes deserti algeriensis* Sharpe.

Cf. *Nov. Zool.* xviii. p. 487.

The typical *algeriensis* inhabits the northern hammada (stony desert) and the southern slopes of the Atlas Mountains. In former years Mr. Rothschild and I found it south to Kef-el-Dor, between Biskra and Tonggourt, and common at Ghardaïa. The wings of males measure generally from 97 to 100, exceptionally (Biskra, where others are smaller) to 104 mm.

**Ammomanes deserti algeriensis > mya.**

A pair from Safet-Iniquel, 30 km. north of El-Golea, shot on March 23, measure: ♂ 102, ♀ 95 mm. Their bills are larger than in regular *algeriensis* from Biskra, El-Kantara, Ghardaïa, Tunisia. A male from Kef-el-Dor, 18. iv. 1909, has the bill as long and almost as strong as in *A. d. mya*, while the wing measures 99 mm. or a little more, being somewhat worn. Three specimens from the hammada between Ghardaïa and El-Golea (♂ 20 km. south of Ghardaïa, 28. v., ♂ 25 km. south of Ghardaïa, 27. v., ♂ 55 km. north of El-Golea, 20. v.) have bills larger, especially thicker, than usually seen in *A. d. algeriensis*, 17—18.5 mm. in length, and wings of 98 to 100 mm.

It is therefore reasonable to suppose that *Ammomanes deserti algeriensis*, in its southernmost localities, leans towards the southern *Ammomanes deserti mya*, at least in the form of the bill, and this is best expressed by the usual formula, *A. d. algeriensis > mya*.

**12. Ammomanes deserti mya Hart.**

*Ammomanes deserti mya* Hartert, *Ann. & Mag. Nat. Hist.* ser. 8. vol. x. p. 230 (August 1912—Oued Mya).

After leaving the rocks called Safet-Iniquel, about 30 km. north of El-Golea, on March 23, no *Ammomanes* were met with until we came to the Oued Saret, a sandy river-bed separated in some places from the surrounding hammada by low cliffs. This is a distance of 138 km. from Safet-Iniquel, and the latter is an isolated outpost for *A. d. algeriensis*, while north of the Oued Saret there was no sign of *A. d. mya*. Naturally, as soon as a desert-lark so far south, in a new locality, was seen, a few were procured, and we were at once struck by the size of the beaks. Afterwards this same form was again found at Fort Miribel and in all the affluents of the southernmost Oued Mya and in the latter itself; also in the gorge of the Aïn Guettara, and on the slopes of the Tademaït, 2 or 3 km. south of Aïn Guettara.

In the Oued Mya region this lark was quite common. What struck me most was the different, louder and deeper call-note (dyüp, dyüp), and the different song. Instead of the monotonous “djirreü, djirreü, djirreü” of *A. d. algeriensis*, it sang like “tirrhuit, tirrür, tirrür, djiarrür, djiarrür,” the various notes not all alike, but different and variously modulated.

In colour the two allied forms vary very little, but generally *A. d. mya* is less reddish, especially on the rump and upper wing-coverts, and there is more black on the inner webs of the rectrices; in size, however, the differences are striking, *A. d. mya* being much larger: wings of males 107—111, females 97—101, tail about 74—76.5, bill much thicker and longer, 18—20, once 20.9 mm.

We found a number of nests of this Lark. They were placed in shallow holes on the rocks along the banks of the river-beds, and had a long wall of stones, like the nests of *Oenanthe leucura syenitica* and *leucopyga*. Unfortunately, in spite of the greatest efforts, we found no eggs; most of the females seemed to lay later, but others must have had eggs.

**13. Ammomanes phoenicurus arenicolor (Sund.).**

Cf. *Nov. Zool.* xviii. p. 487.

Like Koenig years ago, and Mr. Rothschild and myself in 1909, we found this graceful little Lark soon after Bordj (hegga on the stony plain intermixed

with sand; and such country, viz. sandy plains or plateaux with stones and rocks, are the principal localities where this species is found. According to my experience it does not inhabit the very barest hammada nor the rocky mountains, which are so often the home of *A. deserti algeriensis*.

We found it not rare on the plateau east of Ghardaïa, but generally in sandy oueds. About six or eight specimens were observed, and three of them shot, about half-way between Onargla and El-Golea, on March 19, on a gravelly plain, where stones appeared in quantities.

On April 2 a pair was observed on stony ground near the sand-dunes of the Erg-bent-Chaouli; then again on April 5, in a sandy river-bed (Oued el-Far), in the middle of an endless hammada, 25 km. south of Fort Miribel.

Farther south four specimens were seen together in the sandy river-bed of the Oued el-Abiodh, north of In-Salah, on April 14, two of which were shot; they had ovary and testicles very small, being evidently some time before their nesting season. None were observed in the same neighbourhood on April 25.

On our return journey quite a number were seen in the entirely sandy plain between El-Alia and Bledet-Ahmar. All the specimens from these various localities were the same, though varying individually a good deal, especially on the crown, hind-neck, and back.

No eggs were found, but a nest with naked young was discovered on June 2, 26 km. east of Ghardaïa (Pl. VI.).

#### 14. *Galerida theklæ deichleri* Erl.

Cf. *Nov. Zool.* xviii. p. 495.

As in 1909, we found this very pale form on the sands north of Kef-el-Dor, but it was not very numerous there by the end of February. One of the specimens had some feathers on the back moulting, and the testicles of the males were swollen.

South of Touggourt this Lark was common near Hassi Arefidji and to the north of it, as well as southwards to near Ngoussa. **This was the southernmost place where any Crested Larks were found** during our journey, and Spatz's observations agree with ours. No Crested Larks are found near Onargla.

On June 6 these Larks were common at Dinar, 50 km. south of Touggourt, but the old birds were in such horribly worn plumage that we refrained from collecting more than one. A young bird shot there on that date is rather interesting, as even in this juvenile age it can be distinguished from the young of *Galerida theklæ carolinæ* (and from those of the various forms of *G. cristata*) by its paler colour, the blackish spots before the whitish tips of the feathers being more restricted and paler brown.

These Larks only inhabit sandy plains, generally, though not always, places where a few flat stones appear among the sands. They do not frequent dunes or hammada.

We collected this year thirteen specimens. There is very little variation in this series.

On June 11, near El-Alia, we found a nest with two naked young and two addled eggs. They are spotted with pale brown and grey, typical for *theklæ* eggs, and measure 23 × 18.8 and 23 × 18.5 mm.

15. *Galerida theklæ carolinæ* Erl.

Cf. *Nov. Zool.* xviii. p. 494.

On the outward journey down to Tidikelt we never saw this subspecies, but returning northwards to Ghardaïa we came across it for the first time on May 25, 90 km. south of Ghardaïa, on the side of an oued with rich vegetation, on rocky slopes. In the evening, 75 km. south of Ghardaïa, young ones were flying about. On the 26th and 27th none were observed, but on the 28th, about 20 km. south of Ghardaïa, a few were met with, but they were in such bad plumage that only one was preserved. After that a few were found on the plateau east of Ghardaïa, about 25 km. from that town, and around the Bordj and Hassi Rebib, in the river-bed of the Oued Nça, 53 km. from Ghardaïa. Some young birds in first plumage were collected, which are distinctly more rufescent than those of *G. t. deichleri*, with more prominent markings. Our series of this year (only six adult specimens) varies not very much, and shows clearly, even in the most worn specimens, the reddish tinge of the upperside which characterises this subspecies.

16. *Galerida cristata arenicola* Tristr.

Cf. *Nov. Zool.* xviii. p. 493.

While going from Biskra to Bordj Saada these Larks were common, and to our astonishment we saw two of them soaring skywards and singing. I said to Hilgert, this **must** be a *G. theklæ*, probably *deichleri*, as we had never seen any *G. cristata* doing this; so we watched one of the males and shot it when it descended to the ground, but it was none other than a typical *G. cristata arenicola*. This fact shows that our observation of 1909 and 1911 (cf. *Nov. Zool.* xviii. p. 489) that only *G. theklæ* sings soaring skywards is not without exceptions.

We saw *G. cristata arenicola* several times along the road to Touggourt, and from Touggourt to Bledet-Ahmar, where it was not rare close to the oasis. **Farther southwards it did not occur.** Worn summer specimens are of course very dark when the pale borders of the feathers are half gone.

17. *Galerida cristata macrorhyncha* Tristr.

Cf. *Nov. Zool.* xviii. pp. 489 and 492.

The only place where we came across long-billed Crested Larks, which we believe to belong to this closely allied race, was a few kilometres east of Guerrara and close to that town. We shot two adult and one young specimens, but the old birds are in such worn plumage that little can be said about them, and exact measurements cannot be taken. Nevertheless we believe them to be *macrorhyncha*, and not *arenicola*; the male has the wing about 112 (at least), the female 102 mm.

It is strange to find two subspecies as close together as Guerrara and Touggourt to Bledet-Ahmar, but both places are outposts from the principal strongholds, and Guerrara is more or less stony ground, while at Touggourt and Bledet-Ahmar these Larks live on sand. The male from Bledet-Ahmar has the wing of nearly 110, the female one of 104 mm., but we consider them nevertheless to belong to *arenicola*.

[No Skylarks were seen south of Biskra; it seems therefore that they do not range to the real Sahara. Cf. *Nov. Zool.* xviii. p. 497.]

18. *Alaemon alaudipes alaudipes* (Desf.).

Cf. *Nov. Zool.* xviii. p. 497.

The Muka of the Arabs is the delight of every traveller in the desert, and often have I listened to its plaintive, enchanting, flute-like notes. It is chiefly found in sand districts, if there is sufficient vegetation, but it adapts itself also to the oueds in the hammada, far away from the sands.

It is very common between Biskra and Touggourt, and from Touggourt to Onargla. South of Onargla it is rarer and more local, but extends sparingly down to El-Golea, and near that place, as well as around Hassi Okseibat, south of El-Golea, it is not rare. Farther southwards, and even in the Southern Oued-Mya region, it is almost absent, but it was heard in the latter place on April 30; and south of Aïn Guettara, in the bed of the Oued el-Abiodh, on April 14, one pair was seen and obtained; others could not be found.

The male of these southernmost specimens is exceptionally rusty on the upperside, almost as brown as one from the Cape Verde Islands, while the female is very pale.

Mukas were not rare generally between El-Golea and Ghardaïa, and from Ghardaïa to Touggourt.

The first young ones, tiny creatures unable to fly, running swiftly across the sebcha, were seen on March 30, near El-Golea. Afterwards many young were seen flying about on the plateau east of Ghardaïa. They had begun already to moult into the first autumn plumage on June 2 and 3. While the blackish anteapical cross-markings on the upperside are strongly marked in some, they are rather faint in others, and also the dark spots on the throat are sometimes much more distinct than in others.

On May 18 and 22 nests with two eggs each were found north of El-Golea. The first stood in the usual way on top of a bush, the other on the ground, near a stone, a somewhat unusual position. The nests were composed of dry grass and thin twigs, interwoven with spider-webs. The eggs measure  $24 \times 16$ ,  $23.7 \times 16.1$  and  $20 \times 16$ ,  $20.1 \times 15.9$  mm., the latter clutch being unusually small.

19. *Eremophila (Otocorys) alpestris bilopha* (Temm.).

Cf. *Nov. Zool.* xviii. p. 498.

Only seen in two places: Kef-el-Dor, between Biskra and Touggourt, and in the Mزاب country east of Ghardaïa as far as about 25 km. east of Guerrara. From June 2 to 7 young birds were seen, some beginning already to moult into the first autumn plumage. The young before the first moult are on the upperside of a reddish isabelline, each feather with a tiny pale cream (not white) tip; the underside is white with a creamy buff band across the chest and a similar tinge on the flanks; there is no black on the jugulum and forehead, so that such birds, if seen running on the ground, do not give the idea of an *Eremophila* to a casual observer.

20. \**Anthus trivialis trivialis* (L.).

Cf. *Nov. Zool.* xviii. p. 498.

The Tree Pipit was observed in the Southern Oued Mya during the second week of April, and at In-Salah on April 30, also a single specimen on May 10, south of El-Golea.

21. \**Anthus pratensis* (L.).

Cf. *Nov. Zool.* xviii. p. 498.

A few were noticed in El-Golea during the last week of March.

22. \**Anthus campestris* (L.).

Cf. *Nov. Zool.* xviii. p. 499.

A single specimen was shot at Arefidji, out of a small flock, on March 7, one was observed in the most monotonous hammada south of Hassi el-Hadjar on March 17, and again on the 18th and 20th, and it was not rare at El-Golea about March 26; a few were seen in the Southern Oued Mya during the second week of April, and at In-Salah on April 30.

23. \**Motacilla flava flava* (L.).

Cf. *Nov. Zool.* xviii. p. 499.

From March 26 to 28 typical *M. flava* was common at El-Golea; we observed it in the bed of the Oued Saret on April 4, and in the Southern Oued Mya during the second week of April.

24. \**Motacilla flava cinereocapilla* Savi.

Cf. Whitaker, *Birds of Tunisia* i. p. 151.

On March 24 I shot a male from a small flock at Safet-Iniquef, with a white throat, and another at In-Salah, on April 21. Both are typical *cinereocapilla*.

As this Wagtail is a regular migrant in Tunisia, it will doubtless be so in some parts of Algeria. As we never saw it in the eminently suitable country near Lac Fetzara, we doubted whether Yellow Wagtails nested in Algeria, but in 1857 Tristram took eggs on June 9 and 18 in the "Province of Constantine"; these were probably those of *cinereocapilla*.

25. \**Motacilla flava thunbergi* Billberg.

*Motacilla borealis* Whitaker, *B. Tunisia* i. p. 152.

We first met with this form at Aïn Guettara, on April 28, where a pair were running about fearlessly round our tent; as the dark head was at once noticed I shot the pair, which proved to be typical *thunbergi*. After that date these birds were observed on April 30 (three specimens), May 2 to 7 daily (in the Oued Mya and affluents), May 12 at the Hassi Marroket, May 13 and 18 single specimens at El-Golea, and afterwards single examples on May 25 and 27, and even on June 5 a single female, apparently ill, and another at Guerrara, June 6.

In the Southern Oued Mya many were eaten by the Horned Vipers, *Cerastes cerastes* (= *cornutus*).

26. \**Motacilla alba alba* L.

Cf. *Nov. Zool.* xviii. p. 499.

White Wagtails were common at Tonggourt on February 27 to 29, and a few were seen in the Mouleïna, just south of Biskra, on February 20, also on March 8, near Ouargla.

[*Parus caeruleus ultramarinus* is not rare in Biskra, where we saw it feeding its young in June, but it does not occur in any of the southern oases. Cf. *Nov. Zool.* xviii. p. 500.]

27. *Lanius excubitor elegans* Swains.

Cf. *Nov. Zool.* xviii. p. 500.

Common from south of Biskra to Tougourt, and thence south to Ngonsa, north of Ouargla. We do not remember having seen Grey Shrikes at Ouargla, and none are found southwards, not even in the Southern Oued Mya region. In the bed of Oued el-Abiodh, north of In-Salah, an old nest was found which looked like a Shrike's nest, but there were no Shrikes near there this year. North of El-Golea bushes of *Zizyphus lotus* appeared again for the first time in great luxuriance on May 23 between Oued Saadana and Hassi el-Hadadra, 145 km. south of Ghardaïa, and with the *Zizyphus* began at once *Lanius excubitor elegans*. These Shrikes had here partly half-grown young in the nest, partly young flying about and taking care of themselves. They might make two broods here, but maybe that the late broods are only due to loss of the first ones. These Shrikes were very common at Sebseb, 51 km. south of Ghardaïa, in Metlili, Ghardaïa, Guerrara, and very numerous in the bed of the Oued Nça.

The first clutches of eggs (five each) were found near Bordj Chegga, February 22, in *Zizyphus* bushes. An egg was cut out of a female at Tougourt on February 27. A clutch of five was found in a Retam at Arefidji, March 6.

This Grey Shrike, when singing, is often a very good imitator of other birds' calls and songs.

28. \**Lanius senator senator* L.

Cf. *Nov. Zool.* xviii. p. 501.

This bird breeds in Northern Algeria, and we did not find it nesting in the Sahara. We first observed it in El-Golea, March 27, and henceforth it was a common migrant wherever bushes and trees were found. On the return journey these Shrikes were observed in smaller numbers, generally only one or two, here and there, as late as May 16, at El-Golea. A single male was seen on June 5 in the Oued Nça, and after that none were observed.

In Biskra we did not come across the Red-headed Shrike in June, and we therefore doubt if it breeds there—at least in the oasis itself.

The outer tail-feather is sometimes quite white. The Tring Museum has such a male shot at Lambèse on June 3 by Mr. Flückiger, and I shot another at Fort Miribel on April 4. Sometimes the black anteapical patch occupies at least half the feather, sometimes it is reduced to a small spot.

29. \**Muscicapa collaris* Bechst.

*Muscicapa collaris* Bechstein, *Gemeinn. Naturg. Deutschl.* iv. p. 495 (1795—"Europa und Deutschland; in den tiefen Gebirgen des Thüringerwaldes noch am häufigsten." Terra typica: Thüringerwald).

♂ ad. Hassi Marroket, south of El-Golea, 11. v. 1912.

♂ ad. El-Golea, 13. v. 1912.

This bird has not been met with by recent explorers, though Loche stated that it was widely distributed in Algeria, and Whitaker records it as a regular "summer migrant" in Tunisia.

It is doubtless only a bird of passage in N.W. Africa, but probably as regular a migrant in Algeria as in Tunisia.



30. \**Muscicapa hypoleuca hypoleuca* (Pall.).

(= *M. atricapilla atricapilla* auct.)

Cf. *Nov. Zool.* xviii. p. 503.

Mr. Hilgert saw one at El-Golea on March 27.

Not rare on passage in the oases of Tidikelt from April 15 to 24, and again in the Southern Oued Mya region, in the Oued Timbourbar, on May 5.

31. \**Muscicapa striata striata* (Pall.).

(= *M. grisola* auct.)

Cf. *Nov. Zool.* xviii. p. 503.

The Spotted Flycatcher passed through the Sahara from May 5 to the beginning of June, the last being seen on June 5. Specimens which we shot agreed in every detail with Swedish and German ones, not with the dull Corsican *M. striata tyrrhenica*. In 1909 we were convinced that these birds would nest at Hammam Meskoutine, but now we doubt it very much, after seeing how late they pass through South Algeria. No bird should henceforth be regarded as breeding in Algeria, unless nest and eggs have been discovered.

32. \**Phylloscopus trochilus* (L.).

Cf. *Nov. Zool.* xviii. p. 504.

From March 26 (El-Golea) a more or less common migrant, especially at In-Salab, from the middle of April to the 22nd.

On May 1, in the southernmost Oued Mya, about 60 km. north of Aïn Guettara, this species was not rare—though more so than *bonelli*—in the large Tamarix trees, and those seen appeared to be very pale. They belonged perhaps to *P. trochilus eversmanni*. A female which we skinned has a wing of 64 mm. It is whiter on the abdomen than one shot at In-Salah on April 17. It is, however, not easy to distinguish *P. t. eversmanni*.

33. \**Phylloscopus collybita collybita* (Vieill.).

Cf. *Nov. Zool.* xviii. p. 503.

Common migrant from March 8 to the end of April.

34. \**Phylloscopus sibilatrix* (Bechst.).

Cf. *Vög. pal. Fauna* i. pp. 515, 516; *Nov. Zool.* xviii. p. 503.

We observed and shot this species in the gardens of El-Golea on May 15 and 16, and as late as May 23, 145 km. south of Ghardaïa.

These specimens are not particularly bright, and agree better with *Ph. s. sibilatrix* than with the Mediterranean *Ph. s. erlangeri*; the latter is, perhaps, a doubtful race. In the first instance the late Carlo von Erlanger described it as *P. s. flavescens*, a preoccupied name, chiefly on the strength of an aberrant specimen, and I recognised it partly on account of the different song which it is supposed to have; I am, however, now very doubtful if that observation is convincing, as probably the whirring song is not uttered except in the breeding season, and we have still no proof of the breeding in N.W. Africa. Could not all the late birds observed in Mauretania be still migrants? With regard to the brighter coloration of North Mediterranean specimens, more material should perhaps be compared in order to establish the race *erlangeri* for good.

35. \**Phylloscopus bonelli bonelli* (Vieill.).

Cf. *Nov. Zool.* xviii. p. 504.

Bonelli's Warbler was common at In-Salah (April 18 to 22), and in the river-beds of the southern Oued Mya region during the end of April and beginning of May.

36. \**Acrocephalus streperus streperus* (Vieill.).

Cf. *Nov. Zool.* xviii. p. 504.

On May 14 to 16 these Reed-Warblers were common and lustily singing in the reeds of the Lake of El-Golea. In the very thick *Arundo donax* it was, however, very difficult to retrieve any specimen we shot, and so we secured only two, both adult males. These had the testicles quite small, not in the least swollen, and were, probably, not breeding there, but still on migration, notwithstanding the late date.

37. \**Acrocephalus schoenobaenus* (L.).

Cf. *Nov. Zool.* xviii. p. 504.

This species too was very common round the Lake of El-Golea in the middle of May. They were singing, but the sexual organs of the specimens we shot were not in the least enlarged, and I doubt, therefore, if they were breeding in the Sahara.

In 1909 Mr. Rothschild and I were convinced that this bird was breeding at Lake Fetzara, but so far the eggs have not been procured, and thus proof is still wanting.

[*Acrocephalus arundinaceus* (L.), the Great Reed-Warbler, was not met with this year. Tristram (see Sale-catalogue of Eggs collected in Algeria, 1858, p. 9) says that it is found in Algeria wherever there are tall reeds and swamps, and he took eggs in the "province of Constantine" on June 15 and 22.]

38. \**Hippolais icterina* (Vieill.).

Cf. *Nov. Zool.* xviii. p. 504.

A male and female were shot in the gardens of El-Golea on May 13 and 14, evidently on passage.

39. \**Hippolais polyglotta* (Vieill.).

Cf. *Nov. Zool.* xviii. p. 505.

A male was obtained on May 1, in the southernmost Oued Mya, 60 km. north of Aïn Guettara, doubtless on passage.

40. \**Hippolais pallida opaca* Cab.

Cf. *Nov. Zool.* xviii. p. 505.

A female shot in the southernmost Oued Mya, 60 km. north of Aïn Guettara, May 1, doubtless on migration. Larger than *H. p. reiseri* (♀ wing 69.5), slightly darker, and with the same, but a more powerful song.

41. *Hippolais pallida reiseri* Hilgert.

Cf. *Nov. Zool.* xviii. p. 505.

This bird, which is still scarce in collections, was not rare during the last days of our stay in In-Salah, singing merrily in the date-palms and pomegranates. A few

were observed early in May in the Southern Oued Mya region, and a great number in the gardens of El-Golea in the middle of May. They were further observed in the oases of Touggourt, Mraïer, and Biskra. In the latter two these birds were undoubtedly nesting, and in Touggourt and Biskra, June 17 and 18, we saw young birds being fed by their parents. In Mraïer and Biskra we tried hard to find nests, but did not succeed. We did not even see an old nest, and as all our search was in vain, we suspect that these birds nest in palms and other high trees, though this is not the habit of other *Hippolais*.

We are not sure that *H. p. reiseri* nests in In-Salah and El-Golea, but we have little doubt it breeds in the gardens of El-Golea, though no nest could be found—not even an old one; they may, perhaps, also nest in In-Salah, as the sexual organs of the birds shot there were already swollen; it was, however, certainly too early for nests in April, and in the oueds of the desert these birds were doubtless only migrants.

The ten males we collected this year have wings of 63·5 to 67, one 68·5 mm., the two females 62·5 to 64 mm.

42. \**Sylvia hortensis hortensis* (Gm.).

(*Sylvia orphea olim.*)

Cf. *Nov. Zool.* xviii. p. 506.

On May 5 a female was shot 27 km. south of El-Golea, and one or two were noticed a few days afterwards in the gardens of El-Golea.

43. \**Sylvia borin borin* (Bodd.).

(*Sylvia hortensis* auct. mult. errore.)

Cf. *Nov. Zool.* xviii. p. 506.

Not rare in the gardens of El-Golea on May 13 and 14.

44. \**Sylvia communis communis* Lath.

(*Sylvia cinerea* auct.)

Cf. *Nov. Zool.* xviii. p. 506.

Shot May 1, 60 km. north of Aïn Guettara, in the southernmost bend of the Oued Mya, when several were seen; observed in the middle of May in El-Golea, and several times seen between El-Golea and Ghardaïa up to May 26.

45. *Sylvia nana deserti* (Loche).

Cf. *Nov. Zool.* xviii. p. 507.

Travelling southwards, we found this lovely sand-coloured little bird here and there between Biskra and Touggourt, and for the last time between Safet-Iniquel and Oued Djafon, north of El-Golea. We never saw it south of El-Golea, though the country appeared, in certain places, to be quite suitable for it.

On the return journey the Desert Warbler was encountered again about 40 and 50 km. north of El-Golea. It was common near Sebseb, south of Metlili, but still more so in the sand-region of El-Arich, south-west of Touggourt.

Specimens shot on March 4 and 5, about 60 and 75 km. south of Touggourt, had ovaries and testicles already more or less strongly enlarged. One shot on May 20 north of El-Golea had the plumage so much worn that we resolved not to shoot any

more. At Sebseb these birds were singing lustily on May 26, apparently about to make a second brood. On June 6, at El-Arich, about half a dozen nests were found with naked or half-feathered young, either three or four in number. One nest contained two naked nestlings and two eggs; and a nest with four rotten eggs, covered with sand, was found north of El-Golea. Five of the eggs could be blown and saved. They were rather finely spotted, and not so greenish as those found in 1909 (l. c.), and measure  $16.2 \times 12.3$ ,  $16 \times 12.6$ ,  $15.4 \times 12.3$ ,  $16 \times 12.5$ , and  $15.1 \times 12.5$  mm.

46. *\*Sylvia cantillans inornata* Tsch.

Cf. *Nov. Zool.* xviii. p. 508.

Migrating through the central Sahara in April, in small numbers. Males were collected in the Oued Mya on April 8 and as late as May 1, also at In-Salah on April 18.

47. *\*Sylvia cantillans albistriata* (Brehm).

Cf. *Nov. Zool.* xviii. p. 509.

Migrating through the Sahara in March and early April: near Ouargla 10. iii., El-Golea 24. iii., 60 km. south of El-Golea, 1. iv., and a female, which I believe to belong to this form, in the Oued Saret, 4. iv., 1912.

48. *\*Sylvia deserticola* Tristr.

Cf. *Nov. Zool.* xviii. p. 509.

One male Tamerna (north of Touggourt), 26. ii., one male Arefidji, north of Ouargla, 7. iii. The one from Tamerna had wings, tail and body plumage in full moult. The other had only a few of the body-plumes still moulting.

49. *Sylvia conspicillata conspicillata* Temm.

Cf. *Nov. Zool.* xviii. p. 509.

♂ ad, Kef-el-Dor, south of Biskra, 23. ii. The testicles were already swollen, and the bird would probably have nested on the spot.

50. *Agrobates galactotes galactotes* (Temm.).

Cf. *Nov. Zool.* xviii. p. 510.

End of April several times in the southernmost bend of the Oued Mya, apparently still on passage.

Middle of May common in the gardens of El-Golea, lustily singing and possibly nesting, though we could not find a nest, not even an old one.

Very common near the Hassi Rebib in the Oued Nça, east of Ghardaïa. The song is very powerful and pleasant. Nesting in the thick, almost impenetrable Zizyphus-bushes, where several empty nests and one with naked young were found on June 3.

51. *Scotocerca inquieta saharae* (Loche).

Cf. *Nov. Zool.* xviii. p. 510.

Noticed near Kef-el-Dor, south of Biskra, between Touggourt and Ouargla, and from El-Arich to Bledet-Ahmar, in sandy and clayey steppe with *Limoniastrum* and other thick bushes.

A nest with four fresh eggs was found at Arefidji, March 7, in a bush of

*Limoniastrum*. These eggs are rather small, the rufous spots small, but covering nearly the whole egg, though more frequent round the larger pole, and measure 14.9 × 11.6, 14.2 × 11.6, 14.4 × 11.3, and 14.5 × 11.4 mm.

Another nest with three naked young and an addled egg was discovered on June 11, also in a *Limoniastrum*, near El-Alia. The egg is larger and has larger but fewer spots and patches round the thick end. It measures 16 × 12 mm.

### 52. *Crateropus fulvus fulvus* (Desf.).

Cf. *Nov. Zool.* xviii, p. 511.

Seen near Chegga, and in the Mzab country; coming from the south, first met with on May 24 near El-Hadadra, and common on the 25th between Oued el-Abiodh and Bordj Gaa. Adult birds shot on the 25th had their wings, tails and body plumage already moulting.

In Ghardaïa young birds were seen early in June. Plentiful in the Oued Nça, but perhaps most numerous in the oasis of Ghardaïa. We never saw one south of Tonggourt.

[*Turdus merula mauritanicus* breeds in the oases of Biskra, but has not been met with farther to the south.]

### 53. \**Monticola saxatilis* (L.).

Cf. *Nov. Zool.* xviii, p. 513.

A single male was seen and shot in the Oued Saref, 109 km. south of El-Golea, on April 4. Wing 126.5 mm.

### 54. \**Oenanthe oenanthe oenanthe* (L.).

(*Saxicola oenanthe* auct.)

Cf. *Nov. Zool.* xviii, p. 513.

These birds migrate through the Sahara in great quantities. The first seen were some awfully shy males near Ouargla. While at El-Golea, from March 27 to 30, Wheatears were extremely common. Hundreds were caught by the boys for pleasure and food in American penny-traps, the same which one buys in the ironmongers' shops in England. Apparently it has been the habit to catch little birds since times immemorial, but the original crude traps of palm-fibres or horse-hair have been transplanted by the modern traps.

I heard it said by a Frenchman, that bird-catching should not be suppressed, because the sparrows did so much damage to the crops, which is perfectly true; but the sparrows are much too clever to enter the traps often; during our stay in El-Golea one single sparrow got caught in a trap, and was promptly brought to me, as it was known that we were in want of Sparrows, but all the birds caught in great numbers were Wheatears, Pipits, and Yellow Wagtails, and occasionally a Red-headed Shrike and a Swallow, the latter probably knocked down with a stick or stone.

The specimens we examined and skinned all belonged to the typical *oenanthe*.

After El-Golea *O. o. oenanthe* was several times observed along the Southern Oued Mya, at In-Salah (April 17), and as late as May 5 in the Oued Mya.

**[Oenanthe oenanthe leucorrhoea (Gm.).**

Cf. *Nov. Zool.* xviii. p. 513.

Once, on April 10, when out with a butterfly-net to catch *Pieris* and *Euchloë*, I saw a strikingly bright-coloured male with an almost pink chest and of great size; close by were two *O. o. oenanthe*, and the bird was quite tame. I returned soon after with a gun, but could not find the bird again. I do not hesitate to say that the bird must have been a specimen of *O. o. leucorrhoea*.]

**55. Oenanthe deserti homochroa (Tristr.).**

(*Saxicola deserti* auct.)

Cf. *Nov. Zool.* xviii. p. 515.

In Eastern Algeria we found the Desert Wheatear not rare as far south as Ngonssa, north of Ouargla; a few were seen south of Ouargla, March 14, and in the "daya bou-Ziane," April 1; in the Mزاب country it was observed 50 to 60 km. south of Ghardaïa and east of that town, but it was commoner in the plain of El-Arieh and from El-Alia to Touggourt.

On June 11 some old birds were already moulting, while others had not yet begun their moult.

**56. \*Oenanthe hispanica xanthomelaena (Hempr. & Ehr.).**

(*Saxicola "amphileuca"* auct.)

Cf. *Nov. Zool.* xviii. p. 516.

On March 26 and 27 **common** at El-Golea. A great many were seen on the 28th, but we were then already busy with arrangements for our departure southwards, and shot none. The number of migrants seen during these days was so enormous that it was impossible to get series of each species, and we had to be content with samples of each; thus it came about that only three males were shot and skinned, which are all three *xanthomelaena*, but two or three seen in the hands of boys, with throats cut or quills pulled out, were of the same form.

Several *O. hispanica* were seen, but not collected, in the Southern Oued Mya during the second week of April, and one in the Oued Saret on April 3; whether they belonged to the eastern or western form (*O. h. xanthomelaena* or *O. h. hispanica*) I could not say.

**57. Oenanthe moesta (Licht.).**

(*Saxicola moesta* auct.)

Cf. *Nov. Zool.* xviii. p. 516.

Again, as in 1909, we found this species by no means rare south of Biskra, from north of Chegga to Tamerna, north of Touggourt, but we never saw one south of that town.

On our journey from Ghardaïa to Touggourt we came across a pair with young on June 2, 25 km. east of Ghardaïa.

**58. Oenanthe lugens halophila (Tristr.).**

(*Saxicola lugens halophila*.)

Cf. *Nov. Zool.* xviii. p. 517.

Though occasionally seen along the edges of the sebchas and chotts, the chief haunting-places of this Chat are bare hills with clayey slopes, but not rocks, though we have also seen it in the hammada south of Ghardaïa.

Several pairs were observed, and one shot, on the clayey hills 23 km. south of Ouargla, side by side with *Oe. leucopyga aegra*, and again on the hills near the Hassi el-Hadjar, on March 16.

59. *Oenanthe leucopyga aegra* subsp. nov.

(*Saxicola leucopyga* auct. part.)

Cf. *Nor. Zool.* xviii. p. 518.

A renewed examination of our now good series of thirteen Algerian adult males and seven adult females has altered my view, as expressed in *Vög. pal. Fauna* i. p. 700. I find that the Western (Algerian) birds are distinctly smaller, the wings of the males measuring 101—106, and once 107.5 mm., as compared with 106—109 in thirteen Egyptian and Palestine birds in the Tring Museum. Count Zedlitz (*Journ. f. Orn.* 1912, p. 560) gives even 105—113 for thirteen specimens (♂ and ♀!) from Palestine, Sinai, and Arabia, though only 97—103 for four (♂♀) Egyptian ones. Besides the thirteen skins with wings from 106—109 we have also one female from Abu Hamed in Nubia with a wing of barely 96, but against this stands an Algerian female with a wing of only 92 mm.; both these birds are apparently young individuals. The other females from Algeria have wings of 94—100, once 100.5, against 101—102.5 mm. in five examples from Egypt and Palestine.\*

There is thus a marked difference in size, and, considering that 4 or 5 mm. is a lot in small birds, and that their wings can be measured to a nicety, it is worth while to distinguish the form found in Africa Minor by a special name, as above. Type of *O. leucopyga aegra*: ♂ peradultus Gara Klima, 10. iii. 1912, No. 206.

In *Vög. d. pal. Fauna* i. p. 700, footnote, I said that the wings of Egyptian males reach a length upwards to 112 mm., but I cannot now find such a large one, and I am afraid that it was a mistake and should read 109; on the other hand Zedlitz quotes 105—113 for Palestine and Sinai.

In *Vög. pal. Fauna* i. p. 700 I spoke of possible differences between the birds from Egypt (Nubia) and those from Palestine. Count Zedlitz (l.c.) believes apparently too that the latter form is larger. From the material now before me I cannot say if these forms are separable or not, but that does not, of course, affect the status of *O. l. aegra*. It strikes me that our Palestine series shows a fine glossy blue-black plumage, while those from Nubia and Africa Minor are more pure black, without a bluish sheen; as, however, the Palestine birds are all shot in November and on December 4, and our series from Egypt and Africa Minor consists of birds collected from March 3 to June, I would like to see a series of Palestine spring birds and Western autumn specimens before separating a third, Syrian race.

The extent of black on the rectrices varies, but females and young have generally more.

*O. leucopyga aegra* was met with for the first time—one specimen only—on the top of Gara Klima, on March 10. From the clay hills south of Ouargla (see Plate IX. lower photograph) southwards these birds were seen in most suitable localities; they were very rare—in fact only one was seen once—in the immediate neighbourhood of El-Golea, but they were common in the Southern Oued Mya

\* Count Zedlitz (*Journ. f. Orn.* 1912, p. 359) accuses me of a clerical error in giving the measurements of the bills as 20–21 mm., but my statements are perfectly correct, as I measured from the base of the skull, as explained elsewhere.

region. They are absent from the Erg and sandy plains, as well as from the Chotts and Sebchas, as they require rocks, clay hills, steep banks of river-beds, or at least a well for nesting.

We saw the last specimens on the southern escarpment of the plateau of Tademaït, two kilometres south of Aïn Guettara.

Though a single bird would occasionally be shy, as a rule, in spring and summer at least, these birds are very tame and confiding, and I have seen them coming up within three or four yards (south of Ouargla and in the Oued Mya), near the tent, or amusing themselves with a date-stone or picking off flies from an empty sardine-tin. In the south they were, with the exception of the quieter and less confiding *Ammomanes deserti mya*, the only singing birds; they surpassed in beauty many gaily coloured birds, and one did not like to shoot them, though they were common enough. I cannot quite understand how Mr. Spatz can describe these birds as rather shy.

It was of course our great desire to find the eggs of these birds. It is most extraordinary that the nests are so difficult to find. Zedlitz describes this (*Journ. f. Orn.* 1912, pp. 560, 561), and we too have several times searched in vain for hours for nests that we knew must be there. We have, however, found many old nests, and others with young birds, as well as some eggs, at last. A ready-made nest without eggs was found on March 10, another on the 20th, on the rocks called "Djorf-el-Bagra."

On March 31 our luck seemed to have come. In the well called Hassi Marroket I located, after some quiet waiting—the old birds having been made shy by the noisy taking of water for men and camels—a nest in one of the crevices between the stones of the wall, about 2½ m. from the edge; before the hole had been located, Hilgert was let down and unintentionally dipped in the water, but he operated on a wrong cleft; afterwards Ahmed-ben-Naili descended on a rope, and he brought out the two eggs with great difficulty, but to our disgust he cracked one, and they were so near being hatched out and so brittle, that only one could be half-way saved.

It was surprising to me that we found no nest at Fort Miribel. An old nest was discovered in a loophole of one of the houses; but in spite of hours spent in search, no nest was found in the valley, where a pair was observed coming and going. Empty nests, mostly last year's, were several times seen among the rocks on the banks of the Southern Oued Mya, but not until April 30 was another clutch found. It consisted of three eggs; but they were so hard-set that only two could be saved, and those with huge holes, the embryos being cut out.

The next day our efforts were at last rewarded, as we found a nest with three nearly fresh eggs. The eggs are not blue, but of a glossless white with or without the faintest bluish hue, not so blue even as the palest eggs of *Oenanthe leucura*. The six eggs which I can measure are 22 × 16·1, 22 × 15·9, 22 × 16, 23 × 16·7, 22·5 × 16·2, and 22 × 16·4 mm. Small rusty red spots are more or less confined to a zone around the large end, while some show distinctly underlying pale bluish-grey spots. Two faded eggs from an old nest found by Hilgert are smaller, and have much larger spots, but their identity could of course not be proved. The nest is always placed in holes or crevices of rocks, steep banks, or in walls of wells, round gardens, or of buildings. There is mostly a long and often wide path of flat stones laid out in front, if the nest stands far in, but this is entirely absent if the hole is not deep, as in the case of the one with three eggs found on May 1,



and the one down the well of Marroket. The nest consists of fine stems of various small plants, pieces of wool and hair, outside some thicker stems and fibres, and is laid out with hair and wool of sheep and hares. The number of eggs is usually *three*, but sometimes two only.

The young bird appears to have always a black crown, at least we have never seen one with even one white feather on the head; the central rectrices have white ends, the lateral ones apparently always black spots; the plumage is dull sooty blackish, with brownish-white tips to the feathers of the abdomen and whitish tips to the larger upper wing-coverts. Our recent observations have convinced us that, in fact, the majority of old birds put on a white cap. Most of the entirely black-headed birds we shot have brownish quills, showing that they are only birds of last year; **south of El-Golea we have only once seen black-crowned birds** — *i.e.* a pair not far from Hassi Marroket. Near Ghardaïa, however, such specimens were not rarely observed, but very few seem to breed in that plumage and to be really quite old birds; in the few cases where black-headed birds had paired and bred the male as well as the female had black heads, as observed by Koenig long before us.

60. \* *Saxicola torquatus rubicola* (L.).

(*Pratincola rubicola* auct.)

Cf. *Nor. Zool.* xviii, p. 519.

We only recognised a single individual on April 12, in the Southern Oned Mya region, which was not shot.

Evidently the Stonechat is not a common, and perhaps not even regular, migrant through the Sahara, but appears to winter principally in the northern parts of Algeria, and in Africa Minor generally, also in Egypt.

Reichenow, *Vög. Afr.* iii. p. 732, records only the following localities in tropical Africa: Beni-Amer, teste Heuglin, Kikuju and Nandi (specimens collected by Dr. Ansorge in Tring), Naiwasha Lake, collected by Fischer, Senegal, according to statement of Swainson, and Fernand Vaz (Gaboon), teste Marche and Comp.

61. \* *Saxicola rubetra spatzi* Erl.

(*Pratincola rubetra spatzi* auct.)

Cf. *Nor. Zool.* xviii, p. 519.

Was observed frequently passing through the Sahara from April 12 to the end of that month, and even as late as May 12 and 16 several specimens were observed and two females shot on the 12th, no male being seen that day.

The four specimens which we collected (15. iv., 30. iv., 12. v.) are all of the pale form called *S. r. spatzi*, like all those shot in Algeria in former years.

62. \* *Phoenicurus phoenicurus phoenicurus* (L.).

Cf. *Nor. Zool.* xviii, p. 519.

On March 20, about 184 km. south of Onargla, an old male was observed, and a fair number were frequenting the gardens of El-Golea from March 27 to 30. After that a few were seen on April 30 in the Southern Mya, on May 1 in the same region, on May 14 and 17 in the gardens of El-Golea, and on June 5 in the bushes of the Oned Nça.

The specimens collected at El-Golea are typical *P. p. phoenicurus*.

63. \**Diplootocus moussieri* (Olphe-Galliard).

Cf. *Nov. Zool.* xviii. p. 520.

This beautiful bird is not a real Saharan species, though it winters in the northern desert. We saw a few between Biskra and Touggourt, and shot an adult male at Kef-el-Dor February 22.

64. \**Luscinia megarhyncha* Brehm.

Cf. *Nov. Zool.* xviii. p. 520.

Three single specimens were recognised : Southern Oued Mya April 7, Igosten April 15, In-Salah April 17.

65. *Chelidon rustica rustica* (L.).

Cf. *Nov. Zool.* xviii. p. 521.

The Common Swallow passes through the Sahara in considerable numbers, though we have never seen a great many together.

The first Swallows, which also in the Northern Sahara are harbingers of spring, were hailed on March 9 in Onargla, and after that again on the 14th. A number were seen in El-Golea from March 26 to 30, and a few, here and there, all the way down to In-Salah, where they flitted round the villages as long as we were there.

On the return journey a few were observed almost every day, and they were common in El-Golea May 14 to 17. After that a few were seen almost daily up to June 5, and on the 6th in Guerrara.

In Temacin and Touggourt Swallows are nesting, as well as in Biskra, but not in very great numbers.

66. \**Hirundo urbica urbica* L.

Cf. *Fog. pal. Fauna* i. p. 807.

Our common House-Martin passed through the Sahara in great numbers. They were numerous in the gardens of El-Golea during the last week in March, and also about the middle of May, though not nesting there. A few were seen at various times in the Southern Oued Mya region and at In-Salah, April 17 to 22.

North of El-Golea, towards the end of May and in June, a few were observed here and there—the last on June 6, in Guerrara—where, however, no nests could be traced.

Apparently the majority of all these birds were typical *urbica*, as shown by a few which we shot.

66A. \**Hirundo urbica meridionalis* Hart.

Cf. *Nov. Zool.* xviii. p. 522.

A dead bird was picked up on April 12, north of Ain Guettara, which by the shortness of its wing (barely 104 mm.) appeared to be of this race.

67. \**Riparia riparia riparia* (L.).

Cf. *Nov. Zool.* xviii. p. 522.

Sand-Martins were observed during our first stay in El-Golea, March 26 to 28, and again as quite common from May 13 to 17. A few were seen during the second week of April in the southernmost Oued Mya region.

We were anxiously looking out for any resident Swallows in the south. Rohlfs, who—though without any knowledge of zoology—was a most trustworthy explorer, says in his work, *Reise durch Marokko, etc.*, 1868, p. 143, and 2nd edition, 1869, p. 164, that in the oases of Tuat a kind of House Swallow was sedentary, winter and summer, which had a square tail and grey plumage. There was no sign of such a bird in Tidikelt, and I was assured that all kinds of Swallows were only known as migrants in autumn and spring. I suppose Rohlfs saw Sand-Martins, and was wrongly informed that they bred in the oases.

68. *Apus murinus brehmorum* Hart. (?)

Cf. *Nov. Zool.* xviii. p. 523.

We saw a few Swifts only, in two places : at Guerrara and at El-Alia, 80 km. south of Touggourt.

In the first place three or four were seen just before dusk over the town, and a pair next day on some rocks east of the place, of which we succeeded in shooting one, on June 7. Half a dozen or so caught insects at El-Alia, 80 km. south of Touggourt, on June 9, in the late afternoon, and of these too we were able to get one. We cannot doubt that the latter were nesting near by, and we are sure that the pair of June 7 nested somewhere on the rocks.

None were seen afterwards, except at Biskra, where dozens came on certain evenings and flew round the huge chimney of the electric works, near the station.

The two we skinned are so pale that they could be taken for *A. m. murinus*, and the one from El-Alia is lighter than the Guerrara specimen. One from Cape Blanco (south of Rio de Oro) and three from the plain south of Biskra are equally pale, while one from Alger is much darker ! Perhaps more material will prove that the birds breeding south of the Atlas are all paler, and either *A. m. murinus* or an intermediate form ?

69. \**Caprimulgus europaeus meridionalis* Hart.

Cf. *Nov. Zool.* xviii. p. 523.

A single male was found in the gardens of El-Golea on May 14. It belongs to the pale Mediterranean form, though the wing measures 189 mm.

A male was seen at Igosten on April 23, which looked very black and large, and of which I have no doubt that it was *C. e. europaeus*. I saw it on a palm-leaf close to me, but it was afterwards so shy that I could not get near enough to shoot it with the small walking-stick gun, which was generally sufficient for collecting in the gardens, where firing with a twelve-bore was not desirable, because the shot damaged the dates and the noise frightened young and old.

70. \**Caprimulgus ruficollis desertorum* Erl.

Cf. *Nov. Zool.* xviii. p. 523.

There must have been quite a migration through the Sahara towards the middle of May.

A female was found in the open stony desert on May 11, 48 km. south of El-Golea, a male flew round the camp on the 12th, 29 km. south of El-Golea, and another male was shot in the gardens of that oasis on the 14th. None were seen in the Oued Nça, and there can be little doubt that this species does not breed in the desert.

71. *Caprimulgus aegyptius saharae* Erl.

Cf. *Nor. Zool.* xviii. p. 524.

Although a typical Saharan form, this bird does not, during breeding-time, reach very far south into the desert. The southernmost places where it was found were the Oued Nça, between Ghardaia and Guerrara, and the sand district of El-Arich, where it appeared to be common, as we saw a number of young birds, though, by ill luck, no adult bird was there procured. A fine adult male, however, was shot on June 11, 40 km. south of Touggourt, between Hassi Dinar and Bledet-Ahmar; this bird was still in beautiful plumage, though the body-feathers were already in moult.

Near Bledet-Ahmar is also the southernmost place where this Goatsucker had hitherto been found, by Koenig.

The young birds—fully fledged June 4, Oued Nça—so closely resemble the adult birds that they cannot be distinguished when flushed out of the desert grass; the blackish markings are everywhere finer, less sharply defined, the white patches on the sides of the throat only indicated, otherwise there are no differences in coloration.

Quite a number of Goatsuckers got up before the diligence during our night drive from Touggourt to Biskra, especially north of Mraïer, which could not have been anything else than *C. ae. saharae*, their pale sandy plumage being very noticeable in the faint moonlight. On June 17, when coming up from Touggourt with the camels, Ahmed-ben-Naïli found a clutch of two eggs, of which he unfortunately broke one. The remaining one closely resembles the two I found in 1909, and measures  $32.1 \times 22.5$  mm.

72. \**Coracias garrulus garrulus* L.

Cf. *Nor. Zool.* xviii. p. 525.

Only single specimens observed in the Oued Nça on June 4, at El-Golea on May 16, and near the oasis of Sebseb on May 27, but always so shy that we were not able to shoot one.

73. *Merops apiaster* L.

Cf. *Nor. Zool.* xviii. p. 524.

Only a few times did we observe Bee-eaters in the south: on April 8 in the Southern Oued Mya, and on April 17 and 18 at In-Salah. Neither here nor there were they nesting, but in the Oued Nça a few were seen which seemed to have their nests on the steep banks.

74. *Merops persicus chrysocercus* Cab. & Heine.

Cf. *Nor. Zool.* xviii. p. 524, pl. ix.

Nesting on the steep banks of the Oued Nça. On June 5 a clutch of five eggs was taken, but they were so much incubated that only three could be saved. On June 6 a full clutch of five, almost fresh, was dug out, while in another hole young birds were already found. The holes were about a metre deep. One old bird was shot for identification of the eggs.

The latter measure  $26 \times 21.1$ ,  $25 \times 21$ ,  $25 \times 21.4$ ;  $23.5 \times 21.7$ ,  $23.2 \times 22$ ,  $23.7 \times 22$ ,  $23.8 \times 22$ , and  $23.5 \times 21.6$  mm.

75. *Upupa epops epops* L.

Cf. *Nor. Zool.* xviii. p. 525.

During our first stay in El-Golea a few Hoopoes were seen in the gardens, and on March 30 a great number were observed, flocks of five and six, and once twenty-five or thirty together—altogether we must have seen fifty or sixty within half an hour, in and about the outskirts of El-Golea. A few were seen on April 12 (Oued Mya), doubtless on migration. On June 6 I observed a pair (or at least two) in the gardens of Guerrara, and I have little doubt that they were nesting there.

76. \**Jynx torquilla torquilla* L.

Cf. *Nor. Zool.* xviii. p. 526.

March 27 at El-Golea; April 13, Southern Oued-Mya; April 17, In-Salah—the latter not shot.

[We searched in vain for *Bubo ascalaphus* on Gara Klima, where Koenig's brother-in-law shot one. Several crevices and small caves were investigated and possible castings found, but neither here nor elsewhere, in spite of much search, did we come across any Eagle-owls.]

77. *Tyto alba alba* (Scop.).

Only heard and seen on the mosque in Touggourt, where we could not shoot it.

78. *Athene noctua saharæ* Kleinschm.

Since writing about these Little Owls in *Nor. Zool.* xviii. p. 529, with Mr. Rothschild, I have reconsidered their status with the help of a very rich material, and come to the conclusion that the southern form, from south of the Atlas, must be separated from that inhabiting the northern portions of Africa Minor.

These Owls, so common in some parts of Algeria, are rare and local in the actual Sahara. They were, however, not rare in the Oued Nœa, where independent young birds flew about already at the beginning of June.

We were especially interested in these and all other Owls, and did not often go to sleep with the fowls; as we generally watched the lamp to catch moths long after dusk. We saw, however, none of these Owls farther southwards, except once in the Oued Mya, near Tilmas Djilrhempt, on May 2; even there only this one bird was observed and shot, which was evidently a last year's bird, and has a very short wing of 150 mm. The unmistakable note was also heard on May 24, at the Oued-el-Abiodh.

79. \**Asio flammeus flammeus* (Pontopp.).

(*Asio accipitrinus* auct.)

A single bird was seen sitting high up on a tamarisk bush in the desert, 80 km. south of El-Golea, April 2. It is in a peculiar plumage, the tail and secondaries being strongly worn, while the primaries, scapulars, and body plumage are very fresh.

80. *Otus scops scops* (L.).

Cf. *Nov. Zool.* xviii, p. 530.

When we came to Touggourt, where these Owls were common in April 1909, we looked out in vain for them, and we saw none in Ouargla, where we were told that they did not occur. In El-Golea, however, they were exceedingly common during our stay in March. On some days there must have been dozens in the officers' gardens alone, sometimes four and five were found in one tree, and they sat even on small trees in the courtyard of the fort. At night they were very noisy; in addition to its single-noted melancholy call, which resembles that of *Bombinator igneus* and *Alytes*, one heard a louder, gayer one, and sometimes one or two syllables, reminding one of the note of an *Athene*.

In the Southern Oued Mya the remains of a Scops Owl which had evidently been eaten by a bird of prey were found.

When we came back to El-Golea, late in May, our friends had gone, though a single pair was at last heard in the oasis, where it nested, no doubt. We are not sure if these Owls nest in Ghardaïa, as we did not visit the far-off oasis by night, but none were heard near the hotel and fortress.

In the Oued Nça they were rare, but a nest was found with three hard-set eggs in a hole of a huge Terebinth-tree on June 4.

81. *Gyps fulvus* (Gm.).

Cf. *Nov. Zool.* xviii, p. 530.

We saw a single specimen sailing along the mountain range east of Ghardaïa on June 2. Both Hilgert and I had a good look at it through our glasses, so that our identification was absolutely certain.

[We were very disappointed not to see a sign of any other large Vultures in the Sahara. Paul Spatz, however, brought home four eggs taken in March 1898 at a place called El-Anagied, said to be about a hundred miles S.S.E. of Bir Aouine in the Tunisian desert. He was not allowed to proceed farther than Bir Aouine, but he sent his shikari Ali there, who brought the four eggs, but unfortunately no remains of the parent birds. The eggs are in the Erlanger Collection in Ingelheim. They are spotted, and agree with many eggs of *Aegypius monachus*\* (L.), though they are not as thick and as richly marked as some of the eggs of the latter species. They measure  $88 \times 71$ ,  $91 \times 69$ ,  $96.5 \times 65$ , and  $96 \times 65.5$  mm. There is therefore no reason why they should not be the eggs of *Aegypius monachus* (L.), though those of *Otogyps auricularis* are apparently very similar in size and markings. In no case can they be anything else than *Aegypius*, or possibly *Otogyps*.]

82. *Neophron percnopterus percnopterus* (L.).

Cf. *Nov. Zool.* xviii, p. 531.

Scarce in the Sahara, but single specimens seen at intervals as far south as the southernmost Oued Mya, where, however, one or two young birds only were observed, one of which was at last shot.

\* Hitherto called *Vultur monachus*, but in no case can this species be looked upon as the type of "*Vultur*," as it was not included in the genus when that was first established, in 1758.

[*Gypaëtus barbatus atlantis* was not observed south of El-Kantara and Biskra, and cannot be called an inhabitant of the real Sahara. The same is to be said of *Aquila chrysaëtus*.]

### 83. *Buteo ferox cirtensis* (Lev.).

Cf. *Nov. Zool.* xviii. p. 535.

Observed as far south as Aïn Guettara, where also old nests were found. Entirely restricted to mountainous places with high and steep cliffs. Young birds about half-grown were brought to El-Golea on May 17. A nest with young was discovered on the 20th, which was easily accessible. It contained two young, almost ready to leave the nest. An old bird, which to our great surprise was found to be a male, was shot while bringing food. Though Hilgert sat well concealed in a hut built of stones and Retam branches until dusk, no other bird appeared; we therefore supposed that the female had perished, as it could not have been such a bad mother as to leave the young alone from 11 a.m. till 8 o'clock at night. Of the young ones, we skinned one, the largest, and kept the smaller one alive. Together with a young Falcon and another Buzzard which we had brought with us from El-Golea, it gave us much amusement. The Buzzards were fierce and obstinate; they refused food for a few days, threw themselves on the back and fought with their claws when one approached them; they were wide-awake and active, running away in the open desert and climbing rocks when near the tent; they also tried to rob the Falcon of its food, but they were generally silent. The Falcon, on the other hand, was gentle and tame, fed the first day we had him, and kept up a loud cry often for hours. As a rule they did not drink, but during the broiling hot days of the second half of May they began eagerly to drink and to bathe, like the Falcon, when opportunity was given.

We shot two old males, one with the uniform reddish tail of an adult bird, though there is a greyish tinge at the base; the other with a faint subterminal blackish bar and traces of bars on the outer pair of rectrices.

The young birds resemble the adult ones in the blackish brown upperside with wide rufous edges to the feathers; the underside is cinnamon-buff, with wide brown streaks on the sides of the breast; tail rufous, widely barred with blackish brown.

### 84. *Milvus korschun korschun* (Gm.).

Cf. *Nov. Zool.* xviii. p. 536.

Found in the desert wherever hills and rocks are near, as far south as the southernmost Oued Mya, but everywhere very scarce, and generally seen singly or in pairs.

Three eggs were taken on a clay hill with a steep escarpment near the Hassi el-Hadjjar, between Ouargla and El-Golea, already hard-set, on March 17. An adult male was shot in the southernmost bend of the Oued Mya.

### 85. \**Circus macrourus* (Gm.).

Cf. *Nov. Zool.* xviii. p. 536.

I do not remember having seen this Harrier more than once—*i.e.* April 3, 1912, when one or two were seen hunting Short-toed Larks in the Oued Saret. I shot one, which, though cinnamon underneath and earth-brown above, proved to be a male, with very small, narrow, elongated testicles.

86. (?\*) *Circus aeruginosus* (L.).

Cf. *Nov. Zool.* xviii. p. 536.

Several specimens were seen on the lake at El-Golea on March '26, and again, apparently a pair, on May 16, which might have had their nest in the impenetrable reeds.

87. *Circaëtus gallicus* (Gm.).

Cf. *Nov. Zool.* xviii. p. 537.

On June 4 I found a huge nest on an old Terebinth-tree, close to another big empty nest, on which a Short-toed Eagle was sitting very close, hatching an addled egg. The bird proved to be a male.

A single bird was clearly observed at Sebseb, 51 km. south of Ghardaïa.

88. *Falco tinnunculus* L.

Cf. *Nov. Zool.* xviii. p. 538.

Two Kestrels, evidently migrating, were seen on March 14. A single female was observed at Igosten on April 15, and again—possibly the same bird—at In-Salah, where also the remains of a dead specimen were found.

A nest with four eggs (hard-set) was found in the wall of the ruined old Berber town above the abattoirs of Ghardaïa on May 30, and another with half-grown young the following day. On the latter the female was caught with the hand.

Evidently nesting also in Guerrara (seen 6. vi. 1912), Touggourt (12. vi.), Mraïer and Biskra.

89. *Falco biarmicus erlangeri* Kleinschm.

Cf. *Nov. Zool.* xviii. p. 538.

This beautiful Falcon ranges from El-Kantara, where it nests, south to Aïn Guettara, where a pair was observed on April 27. It occurs, naturally, only where rocks afford opportunity for nesting. It does not, however, cling to inaccessible, huge cliffs, but most of the nests we found were accessible without ropes, some easily, others not without difficulty. On May 21 Hilgert discovered a nest with half-grown young on a cliff not more than four metres in height, and barely three above the ground. Through a mishap the old bird escaped us, but a female, off eggs, was shot on April 9 in the southernmost Oued Mya, and an adult male in the same region on May 4. A young bird was killed in the Oued Nça, June 4.

A clutch of two, one hard-set, the other damaged, was taken, 9. iv.; another of two, almost fresh, on April 11. The eggs are placed in small caves, always protected from above, on the bare rock, and the nest is visible by the white excrements.

These birds are very shy, and so are the Buzzards even there in those solitudes, where they are rarely molested.

The plumage and eggs will be described in my forthcoming part of the *Vög. d. pal. Fauna*.

90. \**Ardeola ralloides ralloides* (Scop.).

Cf. *Nov. Zool.* xviii. p. 539.

Observed, but not obtained, at El-Golea, March 26.



91. *Ixobrychus minutus* (L.).

Cf. *Nov. Zool.* xviii. p. 539. (Sub nomine: *Ardetta minuta*.)

A female shot, and another specimen seen, El-Golea, May 15.

92. \**Egretta garzetta garzetta* (L.).

Cf. Loche, *Expl. Scient. Algérie, Ois.* ii. p. 133: *Cat. B. Brit. Mus.* xxvi. p. 119.

Captain Charlet sent me a specimen from In-Salah, obtained in the autumn of 1912.

93. (\*?) *Nycticorax nycticorax nycticorax* (L.).

Cf. *Nov. Zool.* xviii. p. 539.

Twice seen on May 16, at El-Golea.

94. \**Ciconia ciconia ciconia* (L.).

Cf. *Nov. Zool.* xviii. p. 539.

On February 9 we witnessed the arrival of the first Stork, in the early morning; on the same day a flock of probably sixty or eighty was seen from the train in the plain of El-Outaya, near Biskra.

A single stork, dirty and dishevelled, was observed at Igosten, April 15, and another—perhaps the same—at In-Salah on the 22nd.

The most interesting and almost incredible information about a flight of storks is contained in a letter by Capitaine Charlet, dated In-Salah, 19. viii. 1912.

The Captain writes: "The heat this year has been quite uncommon. The natives whom I saw the other day at Aoulef told me that they never witnessed it like that before; the dates are quite hardened, which means a great loss to them.

"The natives have succeeded in **catching at Inrhar, 60 km. from here, in one week over 500 Storks**, which descended half-dead from thirst near the water-basins in the gardens! They reckon that it is a gift of heaven to compensate them for the loss of their date-crop, and eat greedily this game of a novel description."

I need not emphasize the interest attached to this communication. I gather from it, that such quantities of storks do not, as a rule, visit Tidikelt; why they should have been half-starved or weakened from thirst is difficult to understand, as the exceptional heat of last summer did not extend north of the Atlas, and I doubt if it takes a stork longer than a day to fly from the Atlas to Inrhar. What astonishes me most is the early date of this invasion of storks—in August, as the letter was written August 19! I wrote at once, asking if any rings had been found on the legs, as it would be of great interest to know whence these storks had come, and if any were "marked," but so far the answer has not arrived.

95. \**Plegadis falcinellus* (L.).

Cf. *Nov. Zool.* xviii. p. 541.

An adult male, with testicles of the size of a small hazel-nut (17 mm. long), shot at El-Golea, 28. iii. 1912.

96. \**Phoenicopterus roseus* Pall.

Cf. *Nov. Zool.* xviii. p. 541.

On February 20 we found three dead Flamingoes near Bordj Saada, which had struck the telegraph-wires a few days before. According to information of some Frenchmen and Arabs hundreds of Flamingoes were observed in March on the Chott near Mraïer.

97. \**Anas crecca crecca* L.

Cf. *Nov. Zool.* xviii. p. 542.

One examined while it was being plucked for the kitchen, at Ouargla on March 8. Said to be common at times at Ouargla and El-Golea, on passage.

98. \**Anas querquedula* L.

Cf. *Cat. B. Brit. Mus.* xxvii. p. 293 (" *Querquedula circia* "); Loche, *Erpl. Scient. Algérie, Ois.* ii. p. 376 (*Pterocyanca circia*).

One shot at Ouargla, March 9, when three or four others were seen, and another examined there a day or two after, which was shot by the hotel-keeper.

Many Ducks of various kinds visit the Chotts near Ouargla and elsewhere, and still more, apparently, the lake at El-Golea, but we were too late in the latter place for them; their shooting requires time, as they are generally very wild and every sportsman is after them. Some ducks seen at a distance at El-Golea in March appeared to be *Anas penelope*.

99. *Columba livia livia* L.

Cf. *Nov. Zool.* xviii. p. 543.

Not found among the mountains of the central Sahara, where we visited them. The southernmost place where we saw any was at Sebseb, May 26, where there were a good many, of which a young bird was obtained.

Also seen at Ghardaïa.

100. *Streptopelia turtur arenicola* (Hart. L.).

(? Partim !)

Cf. *Nov. Zool.* xviii. p. 543.

Turtle-doves were once seen at In-Salah and at Igosten, where a male was shot, which is so dark that I cannot say that it differs from *S. t. turtur* of Central Europe; it is, however, a bit greasy, and fat darkens the colours very much; it was shot from a flock of five or six, and its testicles were 2 cm. long and 6 mm. thick.

A number of Turtle-doves were seen at El-Golea in May, and a few single ones on passage north of In-Salah and in the Southern Oued Mya, on April 25 and 28, and May 5, also on May 8, but none could be shot.

A single adult male, with enlarged testicles, was killed 76 km. south of Ghardaïa.

Many breed at Ghardaïa, Touggourt, Mraïer and Biskra, evidently also at Guerrara, where a ♀ was shot on June 7, which is somewhat dark for *arenicola*, but not quite dark enough for *S. t. turtur*.

101. *Streptopelia senegalensis aegyptiacus* (Lath.).

Cf. *Nov. Zool.* xviii. p. 543.

Great numbers nest in the oases of Ghardaïa, and they are by no means rare in Guerrara and Ouargla, nor yet in Touggourt, Mraïer and Biskra.

They are, however, absent from El-Golea and In-Salah. This is very interesting, as it proves that the distribution of this tropical Dove has not taken place through the Sahara, but by way of the coast, *ciù* Morocco.

102. *Pterocles alchata alchata* (L.).

Cf. *Nov. Zool.* xviii. p. 544.

Hundreds passed over the desert in the morning and evening south of Biskra, and especially near Nça ben Rzig, where we shot several on February 25.

Apparently confined to the **northern** desert.

103. *Pterocles senegallus* (L.).

Cf. *Nov. Zool.* xviii. p. 544.

This species goes evidently farthest south in the Sahara. We saw thousands coming from the Oued near Kef-el-Dor, south of Biskra, and they were common near Ouargla, in March. A few were seen near El-Golea, and a female shot on May 16. At certain times they are said to appear in great numbers near El-Golea. We were disappointed not to come across a breeding-place between Ghardaïa and Touggourt, where none were observed.

(There can be little doubt that Daubenton's "Gélinote du Sénégal," on which the name "*senegallus*" is based, never come from the Senegal, though a closer exploration of the Senegal is still a desideratum.)

104. *Caccabis petrosa spatzi* Rehw.

Cf. *Nov. Zool.* xviii. p. 544.

Very common in the Oued Nça, where they had half-grown and two-thirds-grown young during the first week of June. It is also found in the river-beds south of Ghardaïa, as far south as the Oued el-Abiodh, where we came across it for the first time on June 25, coming from El-Golea. They had there already about half-grown young. Also found in small numbers near El-Kantara, where one was obtained this year; this specimen is a shade more greyish than the others, but this is probably due to the wonderful freshness of its plumage, as it was shot three and a half months earlier.

105. \**Coturnix coturnix coturnix* (L.).

Cf. *Nov. Zool.* xviii. p. 545.

We had expected to see much of the migration of Quails, but this was not the case. There were Quails about El-Golea in March, but as they were hidden in the fresh fields, which we did not like to enter, we did not shoot any.

A single one was met with in the Southern Oued Mya region, on April 9.

106. (?\*) **Fulica atra** (L.).

Cf. *Nov. Zool.* xviii, p. 545.

Several Coots were seen on the lake of El-Golea, where they are said to be resident and breeding, since some years.

107. \***Megalornis grus grus** (L.).

Cf. *Nov. Zool.* xviii, p. 546.

Cranes flew overhead, loudly calling, on February 20, in the evening at 7.30 and at 8 o'clock.

108. **Houbara undulata undulata** (Jacquin).

Cf. *Nov. Zool.* xviii, p. 546.

Ranges from Biskra south to the valley of El-Meksa in the Erg-bent-Chaouli, south of El-Golea, and perhaps even farther southwards.

On March 31 some adult birds were shot, and four nestlings caught 46 km. south of El-Golea, near the Hassi Okseibat, on a sandy plain with many stones and a good deal of fine vegetation. The first down is above of a pale cream-colour, more white on neck, head and rump, with rufous-brown patches and black lines, underneath white with rusty rufous markings and a few blackish lines on the throat. The iris is dull pale orange-brown, feet yellowish green, bill horn-black with white point on tip of culmen. The next moult brings forth, on the upperside, cinnamon-buff with black fringes and slate-coloured bases.

109. **Burhinus (Oedienemus) oedienemus saharæ** Rchw. (?).

Cf. *Nov. Zool.* xviii, p. 547; *Handl. Brit. B.* p. 163.

We only came across this species on two occasions. A single bird was seen on April 29 in a small ouéd just north of Aïn Guettara, and promptly shot. Two birds were seen at sunset on June 4 near the Hassi Rebib in the Oned Nça, east of Ghardaïa, of which one was secured. These two birds, together with one from Tihrempt (between Ghardaïa and Laghouat), shot April 14, 1911, are more reddish cinnamon and not quite so pale as our series from Tunisia, Biskra, and Morocco north of the Atlas. It is, therefore, quite possible that another more central Saharan form is separable again from *O. o. saharæ*, but I cannot venture to make this separation on the present scanty series of only three examples. Traces of these birds were seen near El-Meksa, south of El-Golea.

110. \***Glareola pratincola pratincola** (L.).

Cf. *Nov. Zool.* xviii, p. 548.

A flock of five was seen on the edge of the lake at El-Golea, of which I was able to shoot a female.

111. **Cursorius gallicus gallicus** (Gm.).

Cf. *Nov. Zool.* xviii, p. 548.

Often seen between Biskra, Touggourt and Onargla, also half-way between Onargla and El-Golea. On May 24, between El-Hadadra and the Oued el-Abiodh, we again came across this beautiful bird, and afterwards saw it east of Guerrara, at El-Arich and El-Alia.

112. \**Charadrius dubius* Scop.

Cf. *Nov. Zool.* xviii. p. 548.

March 3 near Témaçiu ; 9th and 11th, Ouargla.

113. *Charadrius alexandrinus alexandrinus* L.

Cf. *Nov. Zool.* xviii. p. 548.

We found this bird both times common near Témaçiu, and on June 11, at Bledet-Ahmar, young birds were flying about together with old ones.

114. \**Gallinago gallinago gallinago* (L.).

Cf. *Nov. Zool.* xviii. p. 548.

Near El-Golea, March 27 and 28.

115. \**Limnocryptes gallinula* (L.).

Cf. Loche, *Expl. Scient. Algérie, Ois.* ii. p. 298.

Distinctly recognised at El-Golea 27. iii. 1912.

116. \**Machetes pugnax* (L.).

Cf. *Nov. Zool.* xviii. p. 549.

In small flocks on the Chott near Ouargla on March 9, 1912.

117. \**Tringa* (*Totanus* or *Actitis* auct.) *hypoleuca* L.

Cf. *Nov. Zool.* xviii. p. 549.

Not rare at El-Golea towards the end of March, and two or three on May 15.

118. \**Tringa* (*Totanus* auct.) *glareola* L.

Cf. *Nov. Zool.* xviii. p. 549.

El-Golea, March 28.

119. \**Tringa* (*Totanus* auct.) *stagnatilis* (Bechst.).

Cf. *Nov. Zool.* xviii. p. 549.

Ouargla, March 11 ; El-Golea, March 28 and May 15.

120. \**Tringa* (*Totanus* auct.) *ocrophus* L.

Cf. *Nov. Zool.* xviii. p. 549.

El-Golea, March 28 and May 15.

121. \**Tringa* (*Totanus* auct.) *nebularia* (Gunner).

Cf. Loche, *Expl. Scient. Algérie, Ois.* ii. p. 316, sub nomine *Glottis canescens*.

Ouargla, March 11.

122. \**Hydrochelidon leucoptera* (Temm.).

Cf. Loche, *Expl. Scient. Algérie, Ois.* ii. p. 207, sub nomine *Hydrochelidon nigra*.

One female, El-Golea, May 15.

123. \**Colymbus ruficollis ruficollis* Pall.

Cf. *Nor. Zool.* xviii. p. 550, no. 230 ; *Handl. Brit. B.* p. 158, no. 340.

Hilgert saw one or two on the Lake of El-Golea on May 15.

[*Alcatorda* L.

Cf. Loche, *Expl. Scient. Algérie, Ois.* ii. p. 210.

The Razorbill is rare on the Algerian coast, but M. André Théry shot two specimens off Sidi Ferruch, near Alger, in January 1911, which his son kindly presented to us.]

124. *Struthio camelus* L.

The Ostrich has entirely disappeared from Algeria. The dates of its extinction do not appear to be known. I have been told that a book by the late General Marguerite, entitled *Mes Chasses en Algérie*, contains interesting notes on the destruction of the Ostriches on the "Hauts Plateaux," but so far I have not been able to see this book.

In Tristram's time (*i.e.* 54 years ago) the Ostrich was still common near Tirlhempt, which appears to have been one of its principal and last strongholds in Algeria ; and on the Oued Nça, east of Ghardaïa, where—apparently at the present Hassi Rebib—the *Addax nasomaculata* was also seen at that time. At that time it seems also to have lived between Ouargla and Touggourt.

At the present day only pieces of egg-shells may be found in Algeria and in all the desert, as far as we have visited it. It is quite certain that no ostrich has lived for some time back even as far south as Tidikelt ; and, according to information from M. Brand at In-Salah, it is now even absent from Air (Asben), and not found north of Damerghu, about half-way between Air and Kano, where it still abounds. While we were at El-Golea, two ostriches were brought there and taken to Ghardaïa ; they came from Timbuctu, I was told.

Another question is : were ostriches ever found in the bare Erg or in all the country south of Ouargla, where vegetation is absent, scarce, or intermittent, as in the Oued Mya ? Can the pieces of egg-shells that we find at present be taken as an indication of their former occurrence ?

We have found egg-shells from the sands between Onmach and Mouleïna (near Biskra) and the sands between El-Oued and Touggourt to El-Meksa and the Erg-bent-(haouli, and also some at Foggaret-es-Zoua, the northernmost of the Tidikelt oases.

What struck us, however, was the fact that they were nearly always found in the depressions, which contained wells, and which are probably very ancient resting-places of caravans. I do not doubt that wells have been in much the same places, and caravans have rested there 2000 years ago, as they do nowadays, because the nature of the country demands it ; and together with eggs of the present Ostrich are found those of *Psammornis rothschildi*, the extinct Giant Ostrich, and also, sometimes, pierced pieces of shells used for necklaces and pieces of flint-implements, mostly little spear-heads.

There is little indication of the age of these egg-fragments, and whether those found together with flint implements are of a similar age to the latter ; but probably

they are more recent, though the end of the stone age in the Central Sahara would probably have been much more recent than in Europe. Ostrich-eggs have doubtless always been objects of a certain value and of barter. They could and can be carried for weeks fresh to eat, and would be taken to the camp to be cooked. The empty shells are useful for ornament, and used to be placed on houses, graves and mosques (see Tristram, *Ibis*, 1860, p. 75), and necklaces are made from small pieces. Most of the pieces of necklaces are more or less round (fig. 1): others square (fig. 2).



FIG. 1.



FIG. 2.

Similar necklaces of ostrich egg-shells are nowadays worn by the native women in German South-West Africa.

The most recent egg-pieces we found were those which Mr. Rothschild and I picked up between El-Oned and Tonggourt, in 1909; in fact, these are so fresh and well-preserved, even in colour, that they might be only a few years old. Somewhat older and more coffee-brown on both sides are those found by Carlo von Erlanger in S.E. Tunisia; and still older, more or less brown and half-fossilised, the upper surface deeply pitted, are those we collected in the Erg-bent-Chaouli, near El-Meksa. Hilgert found some south of Biskra, which appear to be of various ages; they were partly put together in little heaps, apparently by children, and left or forgotten. Fragments from Foggaret-es-Zoua (Tidikelt) are very different: they are worn quite thin, and the edges rounded off; the different appearance is probably due to the very different, much coarser sand of Tidikelt.

That the colour is due to the influence of the atmosphere is shown by some pieces in which the underside, which was turned upwards, is brown, while the upperside had remained light, others being brown above and light below, or brown or light above and below.

#### 125. *Psammornis rothschildi* Andrews.

Andrews, *Verh. V. Int. Orn.-Kongr.* pp. 169-173; *Nov. Zool.* xviii. 550.

Fragments of egg-shells perfectly similar to the types of *Psammornis rothschildi* were collected by Hilgert near Biskra, together with Ostrich-egg-shells, and this year in various places between Ouargla and El-Golea. Some of these are less thick than the rest, but otherwise alike. The thinner ones may perhaps have been produced by some last degenerated individuals of the lost race, or be otherwise abnormal. Some are so much in the same state of preservation as some of *Struthio camelus* that they (together with the fact that they are found everywhere with fragments of shells of recent ostriches) disprove the theory, alluded to by Dr. Andrews, that they might be brought up from a considerable depth during the digging of the well. All are brown of various shades, but the majority are of a very deep brown, darker than most of the darkest ostrich-egg fragments.

It is to be hoped that some day bone of *Psammornis rothschildi* will be discovered, to show what this bird was like.

## .CONCLUSIONS.

## I.

The number of species diminishes from the foot of the Atlas southwards. Some of the birds which enliven the northern Sahara, as for example near Biskra and even Ghardaïa, especially the Crested Larks, *Rhamphocorys*, *Fremophila*, *Oenanthe (Saxicola) moesta*, *Calandrella minor*, *Lanius excubitor elegans*, *Argya fulva*, *Caccabis* and others—disappear entirely, mostly between El-Golea and Ghardaïa on the one, and El-Golea and Touggourt on the other side.

Some of the species, such as *Erythrospiza githaginea*, *Athene*, and others, though extending far southwards, become very local and very scarce.

## II.

A few of the species are represented by different subspecies in the central and in the northern Sahara: *Corvus corax tingitanus* by *C. c. ruficollis*, *Ammomanes deserti algeriensis* by *A. d. mya*.

## III.

Some of the birds, and still more so the lepidoptera, coleoptera, mammalia, and plants, are very widely distributed, especially many insects and plants range at least from Arabia and Syria to Marocco, and from Spain to the central Sahara. This is no doubt due to the similarity of desert-country and desert-climate in the various countries and the unbroken desert belt extending from Syria and Arabia to the Atlantic Ocean.

## IV.

The breeding season varies more than in Europe. I do not agree with Count Zedlitz, who concludes that *Passer simplex saharæ* breeds twice in one year; but, since we found fully fledged and naked tiny young birds as well as nearly fresh eggs almost at the same time, I must believe that this bird breeds more irregularly than most birds in our country. The same is to be said about *Oenanthe leucopyga aegra*, *Alaemon*, and others.

I am, of course, well aware of Count Zedlitz' most interesting articles in *Journ. f. Orn.* 1908 p. 480 and *Verh. V. Intern. Orn.-Kongr.* p. 323. I have also experienced myself the great influence of rain in the Sahara. In 1908 and 1909 Mr. Rothschild and I, at various times from February to the end of April, collected in the stretch of country between Biskra and Bordj Saada, and in 1909 we rode from Biskra to Touggourt and back. Very seldom did we see a single white butterfly between Biskra and Bordj Saada, and not one all the way from that Bordj down to Touggourt. In 1912 I saw dozens of white butterflies between Biskra and Bordj Saada, and hundreds of *Melitæa* and yellow-and-white *Euchloë* between Biskra and Touggourt—evidently because there had been more rain in the winter and any amount of vegetation. Whether this could affect the breeding-time of a *Passer simplex saharæ* I cannot say, but I doubt it very much. To seek an undoubted explanation one would have to remain longer in the central Sahara, or visit it more often, and in years with and without considerable winter rains.



## V. Bird Migration.

It will be seen from the narrative of my journey, and from the special part on the birds collected and observed, that innumerable migrants pass through the Western Sahara. For every ornithologist, bird-migration is a most interesting and fascinating subject; and next to egg-collecting, my earliest occupation with ornithology took the form of observing migration on the Baltic shores. Since then this subject has become one of the foremost in ornithology, chiefly through Gätke's *Vogelwarte Helgoland*, the activity of the Royal Hungarian Central Bureau of Ornithology under its gifted chief, Otto Herman, and, more recently, the *Vogelwarte Rossitten*, and the "ringing" in Germany, England (Witherby's activity), and other countries, and last, but not least, Eagle Clarke's *Studies in Bird Migration*.

In spite of all the great work done so far, many questions are still imperfectly answered or quite unsolved.

My explorations in Algeria, with and without the Hon. Walter Rothschild, have given me some opportunities of observing migration, and, together with former experiences, I came to the following conclusions:

The popular belief and the description of the late Professor Newton,\* that northern migrants by the end of the summer, when food becomes scarce in the most northern limits of the range of a species, "begin to press upon the haunts of other individuals; these, in like manner, upon that of yet others, and thus

'The waves behind impel the waves before,'

until the movement which began in the far north is communicated to the individuals occupying the extreme range of the species at that season," is entirely without foundation. I have never been able to see the logic; to my mind it is quite clear that birds are not able to "press upon the haunts of other individuals"; especially in late summer and early autumn there is such a quantity of food, and nowhere are birds so numerous that the immigration of a host of birds could "press upon their haunts," and this movement be "communicated to the individuals occupying the extreme range of the species at that season." Just the contrary takes place: the northernmost individuals are, of course, first compelled to quit their haunts, and they migrate—generally much more slowly and leisurely than on their return journey in spring—farthest south. Thus we see the northern Waders arrive on our shores in the summer, when none of our birds, or hardly any, begin to move. We see birds from the arctic regions migrating south to the equator and beyond, Siberian birds pass the winter in Australia, while Manchurian forms only go as far as middle and southern China; we find the northern Yellow Wagtails going south, at least as far as the Mediterranean form, instead of pressing the latter on before their host; and where the same species inhabits more southern latitudes, the southern form becomes resident, instead of being compelled to move before the invading northerners. Our Wheatear and the Greenland Wheatear (*Oenanthe oenanthe oenanthe* and *Oenanthe oenanthe leucorrhœa*) wander as far south as tropical Africa, while the Mediterranean Wheatears only just reach their winter quarters, and are not pushed on farther south. *Oenanthe hispanica* has not been observed farther south than Senegambia, where it appears to be very rare, but the majority winter perhaps in the Saharan oases; and of the black-throated *Oenanthe oenanthe seebohmi* the winter quarters are not yet known.

\* Cf. *Dict. ſ.* p. 555, and *Nov. Zool.* 1905. p. 16.

Not only the birds of our northern latitudes are migrants, but also many of the insect-eating birds of the Atlas Mountains and North Algeria leave their homes during the winter, such as the Nightingales, Redstarts, Warblers, Swallows and others. None of these are pushed farther south by the inrush of northern migrants; neither *Sylvia deserticola*, *Diplootocus moussieri* nor *Sylvia cantillans inornata* and others have ever been found in Tropical Africa: they leave the mountains in the winter and pass the cold season in the Northern Sahara, while the arctic birds pass through their haunts and proceed farther southwards. In the spring we see the northern birds pass through, when the Algerian ones are already settled and begin nesting!

We should be able to prove more such facts if we could better recognise the local races, and I do not doubt that the enormous strides we are making in distinguishing the various subspecies will bring more such facts to light; in some cases, where we are unable to separate the birds from widely different countries, only "bird-marking" may solve such questions.

We have hitherto been accustomed to look upon, as breeding in N.W. Africa, all birds regularly found there during the second half of May and in June. Our observations of 1912—partly confirmed by Mr. Spatz—show that such conclusions must be drawn very slowly and carefully. A perusal of the foregoing pages will show that we have met numerous undoubted migrants in the Sahara after the middle of May and even in the month of June! There is no reason whatever to doubt that this late migration is a regular phenomenon. As some of these late migrants were observed while their brethren in the north began already to nest, there is reason to suppose that some of them were not breeding in that year, some apparently because they are too young or too old, or—in some cases certainly—injured or otherwise unhealthy; in those cases where these birds were still in flocks such supposition can of course not be made, and we must conclude that they are birds from the most northern haunts of the species, which is proved in the case of *Motacilla flava thunbergi*, which passes through after the passage of its allies, and which goes farthest north. Moreover I agree with Count Zedlitz that some of these do not breed in a given year, though for reasons unknown to us.

A question which has often been discussed is: whether birds migrate with an extended front, or whether they follow strictly defined narrow routes. The theory of the strictly defined routes is based upon the fact that in suitable localities, such as river-valleys (which naturally afford much food), quantities of birds are observed, and that an astonishing number of migrants are seen on certain points of observation, especially small islands, like Heligoland, Fair Isle and others.

The conclusion drawn from these observations is, however, erroneous. The fact is, that birds must feed during migration, and therefore alight where food is found, while they pass over arid or otherwise unsuitable land, and therefore are not observed; and the reason why Heligoland and Fair Isle and other localities are apparently so miraculously favoured by bird migration is, that they afford rest, food, and shelter in a wide area of uninviting sea, and that keen and able observers have made them their observatories!

The various migration routes, as depicted by Palmén and others, are based on meagre records, and most of them were apparently drawn because the map suggested them; thus migration routes cross the Mediterranean where it is narrowest: west of Gibraltar; from Valencia to West Algeria (leaving Alger

itself untouched); from the Riviera to Tunisia, *viâ* Corsica and Sardinia; from Sicily to Tripolitania; from Asia Minor to the delta of the Nile.

From the north-south direction in the fertile and rich valleys of the Rhine and Rhône birds are made to deviate in two directions—back upwards along the Riviera, in order to get across the narrower passages by Corsica and Sardinia, and over to the Spanish coast, in order to get the shorter crossing from Valencia to Oran. On which facts are and can be these conclusions based? On the facts that countless birds are observed in the Rhine and Rhône valleys, that many people visit the Riviera and see numerous migrants, and that it seemed more convenient to cross the Mediterranean where it is narrowest. Similar reasons will no doubt exist for the other crossing-lines.

My reasonings lead to exactly opposite conclusions.

Wherever ornithological observers have chosen places which can easily be surveyed and taken under observation, and watched birds in Europe, migrants were observed in great quantities. In the Mediterranean, for example, there is so far no reason whatever to suppose that they only cross along the given routes, and thus strike the African coast in five or six belts only; but on the contrary migrants have been observed in great numbers wherever ornithologists or collectors have been.

According to those methods we should have at once to construct a mighty route of migration through El-Golea, which is a bird-migration paradise; but suppose I had not stayed in El-Golea, and gone down from Ouargla through the Great Western Erg by Aïn Taïba to Tidikelt, I might have concluded that no bird migration of any extent goes through that part of the Sahara, because I had passed through districts unsuitable for birds to alight and to feed—for few birds will stop in the foodless Erg or desolate Hammada.

Moreover, how can birds see what route they take at night? and if they see the route by day-time, how can they know that it is their route, especially when they see it for the first time? These questions have often been put and ventilated, and I answer them unhesitatingly—without going here again into the questions of leadership and others—**They cannot.**

And what advantage could it be to any of the more powerful fliers—and all true migrants are good fliers—to gain those narrower passages in the Mediterranean? My answer is: **None whatever.**

There is, however, the fact that birds migrate in one direction, and another that they have a great inclination and tenacity of following extended coast-lines; these facts are based on countless observations, and are established beyond doubt.

Thus the majority of birds travel in the autumn in a north-easterly to south-westerly direction, while some species go in the opposite one (in a south-eastern line), thus crossing the lines of other species. This fact, together with the N.E. to S.W. main direction of the West European coasts, brings at once a great mass of migrants down our West European shores, and when they cannot go any farther in Europe they cross over to N.W. Africa. No observations exist to show that this crossing takes place more near the Straits of Gibraltar than farther westwards: in fact, many birds keep on in their south-westerly direction and most unwisely visit the Canaries and even the Azores and Cape Verde Islands, instead of sticking to the hospitable shores of Africa, where they winter. Moreover, some birds miss the land altogether and perish in the ocean, as is evidenced by their frequent alighting on ships in mid-ocean in a tired state.

The preference for coast-lines is not even restricted to migrants, but also sedentary species spread more along the coast-lines than over the inland regions.

Thus we see Mediterranean forms extending along the coasts of Western Europe as far north as England: the White Owl, the Dartford-Warbler, Chough and Gird-Bunting, *via* West France, more or less.

Thus we find tropical birds have extended their range to Africa Minor, undoubtedly by the coast-line and not through the great desert, for they are not found at all in the Sahara, and mostly not even south of the Atlas, but only along the north coast: *Asio capensis* in North Marocco and North Algeria, *Telophonus senegallus* and *Pycnonotus barbatus* in North Marocco, North Algeria and North Tunisia, all three very slightly altered by isolation, *Turtur* (rectius *Streptopelia*) *senegalensis* in the **northern** oases. On the other hand, the Crested Larks, which inhabit Senegambia and Northern Nigeria, have undoubtedly extended their range from Africa Minor to the tropics by the coast-regions, because they do not occur in the central Sahara, but are found at Rio de Oro, under the tropic of Cancer.

I hope to be able to make more observations on these fascinating subjects before long, and trust that a careful study of the local forms of birds, in combination with the valuable experiments of bird-marking, will help us to bring forward numerous proofs of my theories. It must, however, be remembered that birds do not work like machinery and clock-work, and that, therefore, exceptions from most rules will occasionally take place.

## V.

### REPTILES AND BATRACHIANS.

By ERNST HARTERT.

AFTER leaving Ouargla, where Reptiles had been collected by Lataste, Koenig, and others, I began to pay attention to all Reptiles; and especially at El-Golea and farther southwards, from where nothing was hitherto known, we tried to get as many species and specimens as possible, though taking only a few of the largest kind, and a limited number of the common species which were brought in by boys in the oases.

The whole collection was kindly named for me by Mr. Boulenger, who also supplied the description of the two new forms from the Tidikelt oases, and notes on *Stenodactylus petrii*, *Acanthodactylus* and *Chalcides*. My sincere thanks are due to Mr. Boulenger, who thus enabled me to give a list of this collection.

The specimens have been presented by Mr. Rothschild to the British Museum, only some of the *Uromastix* and a few duplicates of lizards being kept in the Tring Museum.

The following works dealing with North-West African herpetology have been consulted:

(1) **Boulenger**: Catalogue of the Reptiles and Batrachians of Barbary (Marocco, Algeria, Tunisia), based chiefly upon the Notes and Collections made in 1880—1884 by M. Fernand Lataste (1891). Plates XIII.—XVIII.

In *Trans. Zool. Soc. London*, xiii.

The standard work of herpetology concerning the fauna of Barbary, upon which all further knowledge on the subject must necessarily be based.

(2) **Boulenger**: Catalogue of Lizards in the British Museum, vols. i., ii., iii. (1885—1887).

(3) **Boulenger**: Catalogue of Snakes in the British Museum, vols. i., ii., iii. (1893—1896).

(4) **Werner**: Ausbente einer herpetologischen Excursion nach Ost-Algerien (1892).

In *Verh. zool.-bot. Ges. Wien*, xlii. Band.

(5) **Werner**: Zweiter Beitrag zur Herpetologie von Ost-Algerien (1894).

In *Verh. zool.-bot. Ges. Wien*, xlii. Band.

(6) **Koenig**: Reisen und Forschungen in Algerien. (Titelblatt ohne Jahreszahl, aber wol 1896 erschienen.)

Appendix I.: Liste der von mir in Algerien gesammelten und beobachteten Kriechthiere und Lurche.

(7) **Anderson**: On a Small Collection of Mammals, Reptiles, and Batrachians from Barbary (1892).

In *Proc. Zool. Soc. London*, 1892.

(8) **Anderson**: Zoology of Egypt, vol. i., Reptilia and Batrachia, 1898. Plates 1—50.

This magnificent work, with its beautiful plates, is not only valuable to a herpetologist, but especially for an amateur in herpetology, on account of its instructive plates, explicit letterpress and biological notes.

(9) **Doumergue**: Essai sur la Faune Erpétologique de l'Oranie.

In *Bull. Soc. Géogr. et d'Arch. d'Oranie*, extract from vols. xix-xxi, 1901. (Only seen after finishing most of the MS. Copy kindly lent me by Mr. Boulenger.)

Neither of the common Algerian *Chelonia*, *Testudo ibera* and *Clemmys leprosa*, extend into the real Sahara. The former Mr. Rothschild and I saw as far south as Lambèse, near Batna, where it is common, while the latter is also numerous near Batna, and occurs in some of the ditches of the oasis of Biskra.

### 1. *Ptyodactylus lobatus oudrii* Lat.

Cf. Boulenger, "Rept. and Batr. Barbary," in *Trans. Zool. Soc. London* xiii. part v. pp. 111, 112 (1891).

Common in the Bordjs north of El-Golea and in houses at El-Golea itself. Not very difficult to catch, though the tails are broken off very easily. Common also near Biskra.

It appears from Mr. Boulenger's notes that "var. *oudrii*" is the western subspecies of *P. lobatus lobatus*, though connected with the latter by a complete intergradation, but generally smaller.

### 2. *Stenodactylus petrii* Anderson.

*Stenodactylus petrii* Anderson, *Herpet. Arabia and Egypt*, p. 96 (1896—Tel el Amarna).

We found this tender little Gecko from the stony plain between the Oued Nça and El-Alia to El-Golea and the Oued Saret between Fort Miribel and El-Golea.

It was found in more or less sandy tracts, under stones, and buried in sand, but not among the dunes.

According to Anderson (*l.c.*) and Boulenger (*in litt.*), it has been recorded by Prof. Werner (under the name of *S. guttatus*) from Touggourt and Mraier.

It is evidently this species also which Koenig (*Reisen und Forsch. in Algerien*, p. 404) records under the name *Stenodactylus guttatus var. mauritanica*, a name which refers to another species now called *S. elegans* Fitz., and which I did not find during the expedition.

### 3. *Tarentola mauritanica deserti* Lat.

*Tarentola mauritanica var. deserti* Lataste in litt., Boulenger, *l.c.* p. 115, in the text.

This very light, pale whitish flesh-coloured desert form is evidently the southern representative of the northern *T. mauritanica mauritanica* (L.). It was common in some of the Bordjs between El-Golea and Ghardaïa, and in El-Golea itself. We saw it also in Touggourt, and the specimen there had the same pale colour as the others.

### 4. *Tarentola neglecta* Strauch.

Cf. Boulenger, *l.c.* p. 116; Koenig, *l.c.* p. 406; Werner, *Verh. k. k. zool.-bot. Ges.* 1894, p. 77.

Kef-el-Dor, on the outer wall of a building, in the forsaken buildings of Fort Miribel, and at El-Golea.

### 5. *Agama tournevillii* Lat.

Boulenger, *l.c.* p. 118; Koenig, *l.c.* p. 407.

One specimen was brought in by one of our Arabs on the way from Ouargla to El-Golea, in March. In June we found this beautifully coloured species quite common in the plain of El-Arich. While close by in the stony tracts the common *Agama inermis* was frequent, the rarer *A. tournevillii* were only seen in the sandy desert, where they sat high up on the bushes of *Retama* in the sun. They could be caught without great difficulty, if not disturbed before.

### 6. *Agama inermis* Reuss.

Common from Biskra to south of Fort Miribel, and specially numerous south of El-Golea and between Ghardaïa and Touggourt, but never among the dunes. In fact, typical for the stony Hammada. Generally sitting on stones, and caught by our men with great dexterity. In this and other *Agamas*, the tails are almost like wire, and not fragile as in so many other lizards. Specimens were therefore always in good condition. The variation in colour is astonishing.

### 7. *Agama bibronii* Duméril.

Cf. Boulenger, *l.c.* p. 118.

This beautiful species was only seen on the sun-burnt black rocks of Aïn Guettara and north of it, in the southernmost parts of the Oued Mya. The

specimens were very shy, and quickly disappeared among the rocks when one tried to approach them. The distribution is peculiar, and we never saw it anywhere else.

#### 8. *Uromastix acanthinurus nigerrimus* subsp. nov.

Structurally like *U. acanthinurus acanthinurus* from Biskra, and *U. a. nigri-ventris* R. and H. from the Mزاب country, but much blacker. Underside in adult males entirely black, of a deeper hue even than in *U. a. nigri-ventris*; underside of tail dark olive to black. Upperside very deep black, with scattered small greenish yellow spots and patches of from one to nine scales; digits underneath often brownish yellow. Largest male from snout to tip of tail, 46 cm. A younger male of 33 cm. is less typical, there being almost as much greenish yellow as black on the upperside, and the underside is not of such a deep black. A male from El-Hadadra, half-way between El-Golea and Ghardaïa, clearly belongs to the same southern form, though it has a little more light spotting on the back. In the same locality, however, a very large and, seen from a distance, apparently entirely black individual was seen, but unfortunately not obtained.

Type: ♂ ad., Southern Oued Mya, 8. iv. 12, in the Tring Museum. Cotypes in the British Museum.

Young individuals are not distinguishable from those of the other races.

We had no time or inclination to collect *Uromastix* near Biskra, but I saw some on the market for sale, freshly stuffed in a rough fashion, for the tourists. They agreed in colour with those we formerly saw, although some had a great deal of black on the undersurface, thus approaching *U. a. nigri-ventris*.

Werner (*Verh. zool.-bot. Ges.* 1892, p. 354) describes his Biskra specimens as "bei Wohlbefinden stets silbergrau mit schwarzer Marmorierung, bei niedriger Temperatur grauschwarz."

He also says that their underside varies from "gelblichweiss bis schwarz."

In *Nor. Zool.* xviii. p. 468 Mr. Rothschild and I described the Biskra form as "more or less dull grey in appearance." Mr. Boulenger (*Cat. Liz. Brit. Mus.* i. p. 407) called them "greyish above, dotted or vermiculated with blackish; lower surfaces lighter, uniform or marbled with blackish," and in his *Catalogue of the Reptiles of Barbary* (p. 119) as "yellowish, greenish, or greyish above, dotted or vermiculated with blackish or brown," but at that time specimens from Biskra, etc., and the Mزاب were not described separately.

When at Ghardaïa we caught one and saw several specimens in the hands of a Dutch artist, and of Professor Surcouf, which agreed with the type of *U. a. nigri-ventris*, and one was even bigger than all we had seen before, and on the upperside of a beautiful golden green colour, with three spotted brown bands.

*U. a. nigerrimus* evidently replaces the other two forms in the Oued Mya region and on the plateau of Tademaït from Fort Miribel to south of Aïn Guettara, and also those north of El-Golea, near El-Hadadra, belong to this blackish form.

I brought home five more or less adult males, one female, and a number of young ones. As I have said before, young ones are not distinguishable from those of *U. a. acanthinurus* and *U. a. nigri-ventris*, and females are less typical or quite like those of the other forms. This is not strange, as females and young of other species of *Uromastix* differ also very much from adult males, and young individuals of *U. acanthinurus* are not even distinguishable from those of *U. ornatus* and *hardwickei* (Werner, *Verh. zool.-bot. Ges. Wien*, 1894, p. 79).

I am therefore of opinion that three forms of *Uromastix acanthinurus* can be distinguished in the Algerian Sahara :

1. *Uromastix acanthinurus acanthinurus* Bell (*Zool. Journ.* i. p. 457. pl. xvii. 1825.--"Africa," exact locality unknown!).

Distribution: Near Biskra, northwards to El-Kantara (I have not examined specimens from other localities).

2. *Uromastix acanthinurus nigriventris* Rothschild & Hartert (*Nov. Zool.* xviii. p. 468).

Distrib.: Mزاب country, Ghardaïa, Tihrempt, apparently also Laghouat. (Probably, judging from the description by Doumergue in *Bull. Soc. Géogr. Arch. Oran*, t. xix.-xxi. p. 109-10, extending to Ain Sefra.)

3. *Uromastix acanthinurus nigerrimus* Hart.

Distrib.: Fort Miribel to Ain Guettara (Tademaït), and rocky hills near El-Hadadra, between El-Golea and Ghardaïa.

The statement of the occurrence of any other species of *Uromastix* in Algeria is apparently erroneous, though Olivier quoted *U. spinipes* as being found near Biskra. *U. acanthinurus* and *spinipes* (*rectius aegyptius* Forsk. 1775).

The Arab name of *Uromastix* is "Dabb."

#### 9. *Varanus griseus* Daud.

We never saw these lizards among rocks and mountains, nor in the bare sand-dunes, but they were not rare in stony or sandy plains and plateaus from Biskra to the plateau of Tademaït, south of which we did not observe them. They live on lizards and small rodents, and do not despise large insects, such as beetles and locusts. A small young specimen was caught early in June near El-Alia. One generally sees the "Ouran," as it was called by our Arabs, on the ground, but sometimes it mounts bushes and lower trees. When pursued, these lizards run very swiftly, with the body well raised. Once I found a hole, with the unmistakable traces of a *Varanus* in front. The Arab who was with me blocked up the entrance, and suddenly a *Varanus* came rushing at us, hissing and hitting the ground with its tail; it attacked me at once, and had two bites into my trousers; it was very amusing in its fury. I expect it had eggs in the hole, but I had no time to dig them out.

The "Ouran" is much liked by the Arabs for food, and, indeed, a well-cooked "Ouran" is excellent eating, tasting very much like a good fresh-water fish. As it can bite very hard, the Arabs, when bringing it for sale, as they do in Biskra, Tougourt, and other places, very often stitch the mouth together.

#### 10. *Acanthodactylus boskianus* var. *asper* Audouin.

*Acanthodactylus boskianus asper*, as I should call this form, is apparently the desert form of the typical *A. boskianus boskianus*, inhabiting the Nile delta (cf. Anderson, *Zool. of Egypt*, Reptilia, p. 150).

More or less common in semi-desert and sandy tracts from Monleïna, south of Biskra, to Tougourt, common between the Oued Nça and El-Alia, about 50 km. south of Ghardaïa, N.E. of El-Golea, between El-Golea and the Oued Saret, and not rare on the plateau of Tademaït as far as just north of Aïn Guettara, south of which we did not capture it.



11. *Acanthodactylus pardalis* Licht.

The distribution of this species in Algeria has been rather imperfectly known. Koenig (*t.c.* p. 411) says only that it is "weit in die Sahara hineingehend," while Werner (*Verh. zool.-bot. Ges. Wien*, xlv. p. 82) says "geht nach Süden etwa bis Cherga."

I have found the species much farther southwards, *i.e.* between Ouargla and El-Golea, and near Guerrara, between the Oued Nça and El-*Alia*, on the way from Ghardaïa to Tougourt. It appears, however, to be rarer than *A. boshianus* and *scutellatus*, but might sometimes have been mistaken for either of them.

There is evidently an ill-defined Saharan race which might have to be called *A. pardalis deserti* (Günther), unless the name *deserti* were preoccupied by the *Lacerta deserti* of Lepechin. From the excellent notes by Anderson (*Reptiles of Egypt*, p. 154) it would appear that the Saharan race was quite recognisable, though intermediates between it and the northern form were found. Koenig's note also supports the view that two forms are separable, but Mr. Boulenger apparently does not believe in their distinctness, as he named my specimens only "*Acanthodactylus pardalis*."

12. *Acanthodactylus scutellatus* Aud.

Cf. Boulenger, *t.c.* p. 130 ("Saharian examples are smaller, more slender and lighter-coloured than the typical form from Egypt"); *Cat. Lizards Brit. Mus.* iii. p. 65 ("a smaller variety, var. *exigua* Lat. = *inornata* Gray, apparently restricted to the Sahara"); Werner, *Verh. k.k. zool.-bot. Ges. Wien*, xlv. 1894. p. 82 ("Kommt in zwei ständigen Varietäten vor, in einer kleineren von Biskra bis Mraïer, und einer grösseren von Mraïer bis Temacin. Die grössere ist die normale dunkel reticulirte Form, die kleinere entbehrt dieser Zeichnung"); Koenig, *t.c.* p. 410 (speaks also of two varieties, the smaller of which he found among the dunes); Anderson, *Reptiles of Egypt*, p. 163; Doumergue, *Bull. Soc. Géogr. et Arch. Oran*, xix.-xxi. pp. 153-60!

This lizard is common enough in the Central Sahara. We caught specimens at Ouargla, between Ouargla and El-Golea, at El-Golea, Fort Miribel, and as far south as In-Salah! Also near Guerrara, between the Oued Nça and El-*Alia*.

Mr. Boulenger says (in litt.): "The specimens from In-Salah represent the typical form. The others belong to the smaller, ill-defined var. *inornatus* v. *exiguus*."

13. *Eremias rubropunctata* (Licht.).

*Lacerta rubropunctata* Lichtenstein, *Verz. Doubl. Berl. Mus.* p. 100 (1823—Egypt and Nubia); Koenig, *Reisen und Forsch. in Algerien*, pp. 93, 412); Anderson, *Zool. Egypt, Reptiles*, pp. 183-6.

I found this species common in the Central Sahara. It was first obtained about 50 km. north-east of El-Golea, then between El-Golea and Fort Miribel, and it was common on the Oued Saret. We did, however, also catch it near Foggaret-es-Zona, the northernmost of the Tidikelt oases. It inhabits chiefly the Hammada.

Until Prof. Koenig obtained it near Ouargla, this species was not known to occur in the Western Sahara, or anywhere east of Egypt. Since then it has been found in Tripoli. Böttger noticed some differences in the scaling between Koenig's specimen and those in the Senckenberg Museum, but these differences are not peculiar to western examples, and not constant. Mr. Boulenger (in litt.) says:

"The *Eremias rubropunctata* which you collected do not differ from Egyptian and Tripolitan specimens. According to Anderson (*Zool. Egypt*), Egyptian examples have 53 to 66 + 12 scales round the body. In four of your specimens, in which I have counted the scales, I find 58, 60, 61, 65 + 12."

#### 14. *Eremias guttulata* (Licht.).

*Lacerta guttulata* Lichtenstein, *Verz. Doubl. Mus. Berlin*, p. 101 (1823—Egypt and Nubia).

Found in the sandy parts between El-Golea and Fort Miribel.

#### 15. *Scincus officinalis* Laurenti.

The "Sandfish," as the Skink is called by the French, is common in the sandy Sahara at Touggourt, from Touggourt to El-Oued, between Ghardaia and El-Golea, at El-Golea, and north of the latter.

In Tidikelt we did not receive or see a single specimen of *Scincus officinalis*.

#### 16. *Chalcides sepsoides* (Aud.).

*Scincus sepsoides* Audouin, *Descr. Egypte, Rept. Suppl.* p. 180, pl. ii. figs. 9, 10 (? about 1829).

*Chalcides sepsoides* Boulenger, *Cat. Lizards Brit. Mus.* 2nd ed. iii. p. 407 (1887—"North Africa, Senegambia, Arabia, Syria"); Anderson, *Zool. Egypt, Reptiles*, p. 220, pl. xxviii. fig. 2 (Egypt); Werner, *Verh. zool.-bot. Ges. Wien*, 1894, p. 84 (Touggourt).

*Chalcides boulengeri* Anderson, *Proc. Zool. Soc. Lond.*, 1892, p. 17, pl. i. figs. 1-3 (Duirat in Tunisia, near the Tripolitan frontier); Koenig, *l.c.* p. 414.

*Chalcides sepsoides* varietas Koenig, *l.c.* p. 414.

Common at In-Salah and Igosten. Habits like those of *Scincus officinalis*. Koenig obtained specimens at and near Onargla (El-Hobra) and Touggourt, where I did not collect reptiles in 1912.

Boettger named the two specimens from El-Hobra (between Ouargla and Ghardaia) and Onargla "*Ch. boulengeri*," while he says of the Touggourt specimen: "Mit 26 Reihen, aber mit Kopfpholidose von *sepsoides*! Ich würde die Form trotzdem zu *boulengeri* stellen! Uebergangsform!"

Mr. Boulenger kindly sent me the following note about these specimens:

"The *Chalcides sepsoides* from In-Salah differ from the typical form, and agree with *Ch. boulengeri*, Anderson, from S. Tunisia, in the fifth labial entering the eye instead of the fourth; in one specimen there are even six anterior labials on one side. Agree with the typical form in the position of the nostril, anterior to the suture between the nostril and the first labial, and in the number of longitudinal series of scales—viz. 24 or 26. 24 is the usual number in the typical form, whilst it is the exception in the In-Salah series (3 cases out of 17). In all the limbs are pentadactyle.

"The name var. *intermedia* might be used to designate these specimens (also found at Biskra) connecting the typical *Chalcides sepsoides* of Egypt with *Ch. boulengeri*."

#### 17. *Chamaeleon vulgaris* Daud.

The Chamaeleon appears not to inhabit, as a rule, the real desert, but it extends into the northern portion of it. It occurs near Biskra, and Koenig found a specimen in Nza ben Rzik, between Biskra and Touggourt. We caught one 50 km. south of

Ghardaïa, but that was the only specimen we came across. It was beautifully green, but after being kept for two days in a bag and equally long on a picture in my bedroom—kept dark for most of the day on account of the flies—it became dark brown. Chamaeleons are very common near El-Kantara, where they occur in wonderful colours, some of the colorations being apparently never described.

### 18. *Coelopeltis moilensis* (Reuss).

*Coluber moilensis* Reuss, *Mus. Senckenb.* vol. i. p. 142, pl. vii. (1834); *Coelopeltis moilensis* Boulenger, *Cat. Snakes Brit. Mus.* vol. iii. p. 143; Anderson, *Zool. Egypt, Rept.*, p. 292. pl. xl.

Large specimens of this snake were caught N.E. of El-Golea and at Fort Miribel. They did not appear to be fierce and irascible, but the Arabs dreaded them, while I did not know they were poisonous. Another large snake of this kind was shot in the Oued Mya, but too much damaged for preservation. In the stomachs I found small mammals.

### 19. *Psammophis schokari* (Forsk.).

*Coluber schokari* Forskål, *Descr. Anim.* p. 14 (1775); *Psammophis schokari* Boulenger, *Cat. Snakes Brit. Mus.* vol. iii. p. 157; Anderson, *Zool. Egypt, Rept.* p. 295. pl. xli, xlii.

In-Salah and southern Oued Mya.

### 20. *Cerastes vipera* (L.).

*Coluber Vipera* Linnaeus, *Syst. Nat.* ed. x. vol. i. p. 216 (1758—"Habitat in Aegypto").  
*Cerastes vipera* Anderson, *Zool. Egypt Rept.* p. 327. pl. xlvi.

This beautiful but dangerous snake appears to be rare in the country traversed by us in 1912. Though we were specially on the look-out for it, I caught only a single specimen in the sandy belt about 50 km. north of El-Golea. The trace of it was plainly visible and leading to a clump of grass, under which the snake was hidden in the sand, only the snout and eyes being visible. The colour was much brighter and more reddish than in the plate in Anderson's work. The stomach contained a yellow wagtail.

### 21. *Cerastes cerastes* (L.).

(*Cerastes cornutus* auct.)

*Coluber Cerastes* Linnaeus, *Syst. Nat.* ed. x. vol. i. p. 217 (1758—"Habitat in Oriente"). (The name "*cerastes*" of 1758 has of course priority over "*cornutus*," whether the translation of Hasselquist's voyage of 1762 or ed. xii. of the *Syst. Nat.* 1766, is adopted.)

This very poisonous snake is common in the Sahara; northwards at least to El-Kantara (where it must be rare, though one was seen in 1908) and Biskra (where it is not very rare). We found it, however, most common in the bed of the southern Oued Mya, where five were seen in one day. One was disturbed in camp, another out of a clump of grass, one was found by Hilgert coiled up close to a freshly killed wagtail, the others were found lying in their usual position, concealed in the sand, mostly close to a little bush or clump of grass, or near a stone, only part of the head being visible. When approached they dart against the enemy, but I have not seen them reaching any farther than about one foot, though Bruce said

they could jump to the length of three feet; stories of their springing to even greater distances can hardly be credited, though it is probable that they can reach as far as their own length. Stories are told of death resulting from the bite of these vipers, but I have not been able to learn of an authenticated case. The native name is "Iefa," the accent being on the first syllable, which is short. In the stomachs of not less than seven specimens during the first days of March we found yellow Wagtails (*Motacilla flava thunbergi*) and Chiffchaffs (*Phylloscopus collybita*), in one both species together. The stomachs of the others were empty.

## 22. *Bufo viridis* Laur.

Not rare at Ghardaïa.

## 23. *Rana esculenta saharica* Boul.

Frogs were very numerous in the "lake" at El-Golea, and in the ditches of the Tidikelt oases called Igosten and In-Salah. I brought home series from both places; and Mr. Boulenger kindly gave me the following description of them, as they belong to a new form.

"*Rana esculenta*, var. *saharica*."

"Agrees with the var. *ridibunda* in the small size of the inner metatarsal tubercle, but differs in the shorter tibiae, which do not overlap when placed at right angles to the body. The tibio-tarsal articulation reaches the tympanum or the eye. Measurement of the eight largest specimens\* :—

	1.	2.	3.	4.	5.
♂ . . .	58	28	28	9	2
" . . .	57	25	27	8	2½
" . . .	54	25	26	7	2
" . . .	54	25	26	7	2
♀ . . .	80	34	36	11	3
" . . .	76	30	33	9	2½
" . . .	73	32	33	10	2½
" . . .	71	32	32	10	3

"Colour olive, with or without blackish spots; a light vertebral line rarely present.

"This variety approaches one from Persia described as var. *susana* (*Ann. & Mag. N. H.* 7. xvi. Nov. 1905)."

\* 1. Length in millimetres from snout to vent; 2. length of tibia (in the flesh); 3. length of foot  
4. length of inner toe; 5. length of inner metatarsal tubercle.

## VI.

DIE COLEOPTEREN-AUSBEUTE DES DR. ERNST HARTERT AUS  
DER CENTRALEN WEST-SAHARA 1912.

BESPROCHEN VON PROF. DR. VON HEYDEN.

Im Jahre 1912 unternahm Dr. Ernst Hartert in Tring, England, in Begleitung von Carl Hilgert aus Ingelheim, als Präparator, eine Reise in die centrale West-Sahara, deren Hauptzweck der Ornithologie und den Lepidopteren galt; es wurde aber auch keine Gelegenheit versäumt Coleopteren zu sammeln. Ausser den grösseren Tieren, die am Tage aufgegriffen wurden, wurde der Lichtfang—eigentlich wurden die Lampen zum Schmetterlingsfang aufgestellt—eifrig betrieben, andere Fangmethoden im allgemeinen nicht angewendet.

Die Beschreibung der Reise und die Besprechung und Bearbeitung der Ausbeute erfolgt in dieser Zeitschrift (*Novitates Zoologicae* 1913), doch gebe ich hier eine kurze Angabe der Route.

20. 1. 1912. Abmarsch von **Biskra** über Bordj Chegga, Kef-el-Dor, Mraïer und Nza-ben-Rzig nach **Touggourt**.

3. 3. 1912. Abmarsch von Touggourt über Bledet-Ahmar und Arefidji nach der grossen Oase **Ouargla**.

13. 3. 1912. Abmarsch von Ouargla über Hassi el-Hadjar nach **El-Golea**. Am meisten Käfer wurden etwa halbwegs zwischen Ouargla und El-Golea, beim Hassi (Brunnen) el-Hadjar gesammelt. Am 24. 3. Marsch vom Hassi Iniquel nach El-Golea, wo die Reisenden eine Woche blieben.

30. 3. 1912. Abreise von El-Golea über Hassi Okseibat, Hassi Marroket, El-Meksa, Oued Saret und Fort Miribel in das Gebiet des **Südlichen Oued Mya**, mit seinem an Vegetation reichen Flussbett und dessen Zuflüssen, in denen im Dezember Regen gefallen war.

Am 11. 4. und 12. 4. Rast an der kleinen Quelle **Aïn-Guettara** an dem wild zerklüfteten, steilen Südsturz des vegetationslosen, unbeschreiblich öden Plateau von Tademaït. Am 14. 4. wurde Foggaret-es-Zoua, die nördlichste der **Tidikelt-Oasen**, erreicht, nach langem Marsche über völlig vegetationslose Ebenen. Am 15. 4. Igosten, 16. 4. 1912 **In-Salah** erreicht.

Am 23. 4. 1912 wurde der Rückmarsch von In-Salah angetreten, und auf demselben Wege durch das interessante Gebiet des **Südlichen Oued Mya** über Fort Miribel nach El-Golea marschiert.

18. 5. 1912. Aufbruch von El-Golea in der Richtung auf **Ghardaïa**, über Hassi Zirara, Saadana, El-Hadadra (Brunnen mit Bordj, d.h. Rasthäusern), Sebseb und Metlili nach Ghardaïa.

Von Ghardaïa ging der Weg über den **Oued Nssa** (oder Nça), wo drei Tage gesammelt wurde, über **Guerrara**, das Sandgebiet von El-Arich und El-Alia nach Touggourt.

Von Touggourt wurde die Heimreise wieder über Biskra angetreten.

Ausserdem sind in dieses Verzeichniss aufgenommen eine Anzahl in den Jahren 1908, 1909 und 1911 von Dr. Walter von Rothschild und Dr. Hartert, besonders 1909 auf der Reise von Biskra nach Touggourt und von dort in das

Sanddünengebiet von El-Oued gesammelter Arten. Die Reise von 1909 nach El-Oued wurde in *Noritates Zoologicae* 1912, S. 460–462 beschrieben.

Ich habe hier diejenigen Arten, die auch im Gebiete von Europa und dem Caucasus vorkommen mit †, vor der laufenden No. bezeichnet. Es sind 82 von den 21 gesammelten Arten.

Die meist ungeflügelten Tenebrionidae haben meist eine geringe geographische Verbreitung. Aechte Wüstentiere sind meist von gelber Farbe, oder dunkel, dann aber mit Grabbeinen oder langbehaarten Tarsen versehen. Die ganze Ausbente hat grossen wissenschaftlichen Wert, dank der genau angegebenen Fundorte; man sieht, dass von einem Fachmanne gesammelt wurde.

Zu grossem Dank bin ich folgenden Specialisten verpflichtet für Bestimmungen einzelner schwierigen Arten:

Louis **Bedel** in Paris: Cantharidae, Oedemeridae, Cerambycidae, Scarabaeidae. Derselbe machte mich mehrfach auf Literaturangaben aufmerksam.

Dr. Max **Bernhauer** in Horn in Nieder-Oesterreich bestimmte Staphylinidae.

Marquis Henri **du Buysson** in Vernet: Elateridae.

H. **Kerremans** in Bruxelles: Buprestidae.

H. **von Kreckich-Strassoldo** bearbeitete das gesammte Anthicidae-Material.

Maurice **Pic** in Digoin: Meloidae, Alleculidae.

Edmund **Reitter** in Paskau-Mähren: Pselaphidae, Liodini, Scarabaeidae.

Siegmund **Schenkling** in Dahlem-Berlin: Litteraturangaben.

Herr Baron Dr. Walter von **Rothschild** hatte die grosse Güte meiner Sammlung fehlende Arten, und den meisten anderen Herren Helfern Belegstücke der neuen Arten zu überlassen. Die Kreckisch'schen Arten kommen in das k. k. Hof-Museum in Wien, übrigens ist im Text angegeben, wo sich Original-Exemplare befinden.

PROFESSOR DR. PHIL. HON. C. JUBILATUS L. VON HEYDEN  
KÖNIGL. PREUSS. MAJOR A. D.

### CICINDELIDAE.

#### † 1. *Cicindela* (L.) *flexuosa* F.

Biskra, 2 Ex., Tonggourt, 2 Ex., 29. ii, Igosten (Tidikelt) 15. iv.

[Häufig in Tonggourt und Igosten. Nach Horn, in litt., verbreitet von Tripolis bis Marokko, Portugal, Spanien, Frankreich—nördlich bis Bretagne, Fontainebleau, Savoie, Schweiz; Egypten, Balearen, Corsica, Sardinien, Sizilien.—E. H.]

#### † v. *circumflexa* Dej.

Tonggourt, 2 Ex.

#### † 2. *C. maura* L.

Hammam Rhira, v. 1911, ein typisches Stück.

#### 3. † *C. lunulata* (F.) v. *maura* Casteln.

Biskra, ein Ex., El-Golea, ein Ex.

#### 3A. *C. Truquii* Guér.

[Die Art wurde von W. v. Rothschild und mir im April 1911 bei Guelt-es-Stel nicht selten angetroffen. Die Ex. wurden von Dr. Horn bestimmt, dem sie damals übergehen wurden. Die Art ist nur von Algerien bis Tripolis bekannt.—E. H.]

4. † **Megacephala** (Latreille) **euphratica** Latr.

Mraïer, zwischen Biskra und Touggourt, 1 Ex., 23. ii. 1912. Auch in Süd Spanien.

**CARABIDAE.**

5. **Calosoma** (Weber) (**Campalita** Motsch.) **Olivieri** Dej.

Ouargla-El-Golea, 1 Ex., 17-19. iii. In Nordafrika und den Azoren verbreitet.

6. **Scarites** (Fabr.) **striatus** Dej.

Oued Mya, v. 1912, Bordj Chegga, 22. iii. 1912. Nördl. von El-Golea, v. 1912. Je ein Ex. Nord Küste von Afrika weit verbreitet.

7. **Sc.** † **terricola** Bonelli.

Touggourt, iv. 1909 einmal.

8. **Tachys** (Steph.) † **sexstriatus** Duft. v. **bisbimaculatus** Chevrolat.

Oued Mya, v. 1912, 24 Expl. In Nordafrika nur diese Rasse.

9. **Heteracantha** (Brullé) **depressa** (Brullé).

Ouargla-El-Golea, 17-19. iii. 1912, 2 Ex.; Nördl. von El-Golea, 1 Ex. Aechtes Sahara Sand Tier. Fliegt Nachts.

†10. **Egadroma** (Motsch.) **marginata** Dej.

Nördlich von El-Golea, 1 Ex. Im Mittelmeer Gebiet weit verbreitet.

11. **Pterostichus** (Bon.) (**Orthomus** Chaud.) **barbarus** Dej.

Nördl. von El-Golea, ein Ex. ohne Beine und Fühler. In S.O. Europa und N. Afrika verbreitet.

†12. **Sphodrus** (Clairville) **leucophthalmus** L.

Ouargla-El-Golea 17. iii., Bordj-Chegga, 22. iii. je einmal. In ganz Europa, Nordafrika, Kleinasien.

†13. **Laemostenus** (Bon.) **algerinus** Gory.

In der Höhle am Djebel Taya, iii. 1911, 6 Ex. Auch Süd Europa. Kein eigentlicher Höhlenbewohner.

†14. **Anisodactylus** (Dej.) **poeciloides** Steph.

Touggourt, iv. 1909, Nördl. von El-Golea, v. 1912. Je einmal. Mit bläulichem Schimmer.

v. **Winthemi** Dej.

Ganz schwarz. Nördl. von El-Golea, v. 1912 einmal. Nur in der Wüste von Algier bis Aegypten.

† 15. **Dichirotrichus** (Duval) **obsoletus** Dej.

Von Bordj Chegga bis Kef-el-Dor, 22. iii. 1912. Lebt an Meerufern und Salzseen, bis nach England hin. Einmal.

16. **Graphipterus** (Latr.) **serrator** Forskal v. **luctuosus** Dej.

Nördl. von El-Golea, v. 1912, 1 Ex.; In-Salah, Tidikelt, Centr. Sahara, 24–30. iv. 1912, 5 Ex.; Arefidji, nördl. von Ouargla, 6. iii. 1912, 1 Ex.

v. **rotundatus** Klug.

Biskra, 14 Ex. Ächtes Wüstentier.

17. **Lebia** (Latr.) **Thais** Bedel.

Oued Mya, Centr. Sahara. Einmal. Algier, Tunis. Selten.

18. **Cymindis** (Latr.) **sitifensis** Luc. v. **pseudosuturalis** Bedel.

Südl. Oued Mya, v. 1912, 1 Ex.; Biskra, 1 Ex. Auch Madeira, Canaren.

v. **leucophthalmus** Luc.

Ein Ex., von Lambesa, 1909.

19. **Metabletus** (Schmidt-Göbel) **binotatus** Reitter.

Oued Nssa (Ghardaïa—Guerrera), 3–5. vi. 1912. Ein Ex.

† 20. **Brachynus** (Weber) **immaculicornis** Dej.

Biskra, 1 Ex. In Süd Europa, häufig.

21. **Anthia** (Dejean) **sexmaculata** F.

Ouargla—El-Golea, 17–19. iii. 1912, 2 Ex.; El-Meksa, südlich von El-Golea, 1 Ex.; In-Salah, Tidikelt, 24–30. ii. 1912, 2 Ex.; Bordj Chegga — Kef-el-Dor, 1 Ex.; südl. Oued Mya, v. 1912, 1 Ex.; Biskra, 4 Ex. Wüsten-Tier.

**DYTISCIDAE.**

† 22. **Eretes** (Laporte) **stictitus** L. var. **helvolus** Klug.

Oued Mya, 4. v. 1912, 2 Ex., in der trocknen Wüste ohne Wasser in der Nähe; der nächste Brunnen ist 25 Km. entfernt. Cosmopolit in der alten Welt der sehr gut und weit fliegt. Auch Süd-Europa, in Amerika seltener.—Uralte geologische Art.

**PAUSSIDAE.**

23. **Paussus** (L.) **Saharae** Bedel.

Oued Nssa, Ghardaïa—Guerrera, 3–5. vi. 1912, 1 Ex. Fliegt Nachts. Ameisengast.



**STAPHYLINIDAE.**

(*Dr. Bernhauer determin.*)

† 24. **Mycetoporus** (Mannerheim) **clavicornis** Steph.

Einmal in der Höhle im Djebel Taya.

† 25. **Tasgius** (Steph.) **ater** Grav.

Biskra, einmal.

26. **Oncophorus Pirazzolii** Eppelsheim.

In-Salah, Tidikelt, 24–30. iv. 1912, einmal. Fehlte in coll. Heyden. In der Nähe der Gattung *Bledius*.

**PSELAPHIDAE.**

27. **Sognorus** (Reitter) n.sp.

Reitter bestimmte so zwei beschädigte Ex. vom südl. Oued Mya, die zum Beschreiben zu schlecht erhalten sind.

**LIODIDAE.**

28. **Chobantiella** (Reitter) **deserticola** Reitter.

Die interessante Vorderschienenspitze nicht zu sehen. Einmal, Onargla—El-Golea, 17–19. iii. 1912. Von Reitter bestimmt.

**HISTERIDAE.**

† 29. **Saprinus** (Er.) **ornatus** Erichson.

Laghounat, iv. 1911, einmal gef. In Nordafrika verbreitet, auch Südrussland.

† 30. **S. Pharao** Mars.

Touggourt—El-Oued, iv. 1909, 2 Ex. ; nördlich von El-Golea, v. 1912, 2 Ex. Auch Aegypt., Caucas., Griechenland.

† 31. **S. figuratus** Mars.

Biskra, einmal. Auch Süd-Spanien.

† 32. **S. chalcites** Illiger.

El-Arich, S.W. Touggourt, 8–9. vi. 1912 ; In-Salah, Tidikelt, 24–30. iv. 1912. Je einmal. Auch Süd Europa.

**HYDROPHILIDAE.**

† 33. **Hydrous** (Dahl.) **pistaceus** Lap.

Touggourt, im April, 2 Ex. Auch Gallia mer., Hispan., Sicilia. [Sehr häufig in den Wassergräben.—E. H.]

34. *Philydrus* (Solier) *maculiapex* Kuwert.

El-Meksa, südl. von El-Golea, 2. iv. 1912, einmal. Aus Aegypten beschrieben.

† 35. *Paracymus* (Thomson) *relaxus* Rey.

4 Ex., El-Meksa, südl. von El-Golea, 2. iv. 1912. Auch Süd-Spanien, Sicilia.

**CANTHARIDAE.**

36. *Rhagonycha* (Eschscholtz) *barbara* F.

Alger, 1–16. iv. 1912, ein Ex. In Nordafrika verbreitet.

37. *Cebriognathus* (Chobaut) *desertorum* Chobaut.

El-Arich, S.W. Touggourt, 8–9. vi. 1912. Zwei Ex., wovon 1 in coll. Heyden. Louis Bedel schreibt mir über das merkwürdige Tier: "Ce genre, qui n'a rien de commun avec les Cebriionidæ, me paraît surtout voisin des *Malacogaster*, *Rhagophthalmus*, etc."—Von Chobaut, *Ann. France Bull.* 1899, 23. "Touggourt, la nuit, à la lumière, dans les dunes. Mon jeune compagnon de voyage, Mr. E. Vareilles, et moi en avons capturé plusieurs exempl. vers le milieu de mai. Plus tard, M. Neureux nous en a envoyé quelques sujets de Hassi-Donionidi, point d'eau entre Touggourt et Onargla."—Jacobson, *Rev. Russe Entomol.* 1912. 136. zieht das 4 mm. grosse Tier zu *Analestesa testacea* Leach, *Zool. Journ.* 1. 1824. 36., was ich nicht nachprüfen kann. Stimmt die Grösse?—Chevrolat, *Ann. Fr.* 1874. 16. sagt über die Leach—Art: "Ne serait-ce pas la *Cistela testacea* F., qu'on rencontre en Barbarie sur le Chrysanthème et sur le Sureau?" (Sureau = Hollunder). *Malacogaster* ist ein Drilide, *Rhagophthalmus* steht bei Lampyridini.

† 38. *Axinotarsus* (Motsch.) *longicornis* Kiesw. ♀ var. *rufithorax* Kiesw.

Biskra, 1 Ex. Auch im Ligurischen Apennin.

† 39. *Divales* (Laporte) *haemorrhoidalis* F.

Biskra, 1 Ex. Auch in Spanien.

† 40. *Psilothrix* (Redtb.) *cyaneus* Oliv. var. *viridis* Rossi.

Biskra, 9 Ex. Durch ganz West Europa bis Helgoland.

41. *Zygia* (F.) *scutellaris* Muls.

S. Oued Mya, Centr. Sahara, 4. 1912. Drei Exp.—Von Biskra und Boghar bekannt.

**CLERIDAE.**

42. *Opilo* (Latreille) *dorsalis* Lucas.

1 Ex., von Touggourt, 29. ii. 1912. Auch in Oran.

**NITIDULIDAE.**

43. *Nitidula* (F.) *ciliata* Er. var. *maculis obsoletis*.

Ein Ex., zwischen Onargla und El-Golea, 17–19. iii. 1912. In N.O. Afrika verbreitet, aber selten.

† 44. *Carpophilus* (Leach) *hemipterus* L.

In-Salah, Tidikelt, 24–30. iv. 1912, ein Ex., Laghouat, im April, ein Ex. Cosmopolit.

**CUCUJIDAE.**

† 45. *Oryzaephilus* (Ganglb.) *surinamensis* L.

In-Salah, Tidikelt, 24–30. iv. 1912., 3 Ex. Cosmopolit.

**CRYPTOPHAGIDAE.**

† 46. *Leucohimatium* (Rosenhauer) *elongatum* Er.

Einmal nördl. von El-Golea, v. 1912. Süd Europa von Spanien bis Caucasus.

**MYCETOPHAGIDAE.**

† 47. *Typhaea* (Curtis) *stercorea* L.

Südl. von El-Golea : El-Meksa, 2. iv. 1912, 1 Ex. Ueberall in Europa.

**PHALACRIDAE.**

† 48. *Olibrus* (Erichson) *castaneus* Baudi.

Nördl. El-Golea, v. 1912, 3 Ex. ; El-Arich, S.W. Touggourt, 3 Ex. Im ganzen Mittelmeergebiet.

† 49. *Tolyphus* (Er.) *granulatus* Guérin.

Biskra, 18 Ex.

**COCCINELLIDAE.**

† 50. *Epilachna* (Redtenbacher) *chrysomelina* L.

Igosten, Tidikelt, 13. iv. 1912, 10 Ex. ; nördl. El-Golea, 2 Ex. In Süd Europa verbreitet.

† 51. *Coccinella* (L.) *septempunctata* L.

Biskra, 11 Ex. ; nördl. El-Golea, 2 Ex. Ueberall in Europa.

52. *Exochomus* (Redtb.) + *flavipes* Thbg. var. *nigripennis* Er.

Nördl. von El-Golea, 1 Ex. Die Stammart in Europa, die var. in Nordafrika. Griechenland und Süd Russland.

53. *Hyperaspis* (Redtb.) + *reppensis* Hbst. var. *Teinturiei* Muls.

Alger, 1 Ex., Stammart Europa, var. Nordafrika.

**DERMESTIDAE.**

† 54. *Dermestes* (L.) *Frischi* Kugelann.

Ein abgeriebenes Stück. Touggourt. El-Oued. Cosmopolit.

† 55. *Attagenus* (Latr.) *trifasciatus* F.

Biskra, 4 Ex. Süd Europa überall.

**HETERO CERIDAE.**

† 56. *Heterocerus* (F.) *flavidus* Rossi.

3 Ex. vom südl. Oued Mya. Ich stelle die Stücke zu dieser Süd-Europ. Art.

**ELATERIDAE.**

(Von du Buysson bestimmt.)

57. *Drasterius* (Eschscholtz) *figuratus* Germ.

Nördlich von El-Golea, 1 Ex. Bis Aegypt. verbreitet.

58. *Cardiophorus* (Eschsch.) *stoliger* Buyss. var. *Leprieuri* Pic.

Oued Nssa, Ghardaïa—Guerrara, 3-5. vi. 1912, 1 Ex.; Oued Mya, v. 1912, 3 Ex. Die Stammart beschrieben *Ann. Fr.* 1902, 429. Die var. in *Echange* 1902. 64 (Isidns), aus Ramlé, Aegypt.

59. *Perrinellus* (Buyss.) *Bonnairei* Buyss.

1 Ex. von Laghouat, iv. 1911, wo die Art von Hénon und Martin schon gef. wurde. Beschrieben *Ann. Fr.* 1893, *Bull.* 17. von Oran: Ain Sefra, auch *Ann. Fr.* 1902, 430.

60. *P. Chobauti* Buyss.

Oued Nssa, Ghardaïa—Guerrara, 3-5. vi. 1912, 7 Ex.; nördl. von El-Golea, 1 Ex.; El-Arich, S.W. Touggourt, 8-9. vi. 1912, 2 Ex. Sandtier, in Pflanzenwurzeln wie Nos. 58. 59. Beschrieben *Ann. Fr. Bull.* 1899, 213.

**BUPRESTIDAE.**

61. *Julodis* (Eschsch.) † *onopordi* F. var. *Königi* Mnhm.

Biskra, 6 Ex. Stammart Süd Europa, var. in Alger.

62. *J. Lucasi* Saunders.

Oued Mya, 2 Ex., Algerische Art. [Häufig an Raetam anfangs Mai.—E.H.]

63. *J. Aristidis* Lucas.

6 Ex., von El-Arich, S.W. Touggourt, 8-9. vi. 1912. Alger, Sahara, Tunis.

† 64. *Aurigena* (Laporte) *unicolor* Oliv.

3 Ex. von Biskra. Auch Gall. mer.

† 65. *Acmaeodera* (Eschsch.) *18-guttata* Piller.

Hammam Rirha, Nord Algeria, Mai 1911. Auch Süd Europa.

† 66. *A. cylindrica* F.

Ebendaher, 1 Ex. Auch Süd Europa.

Ebenso. † 67. *A. adpersula* Illig.

† 68. *Sphenoptera* (Solier) *rauca* F.  
Ebenso (Kerremans's determ.).

#### **BOSTRYCHIDAE.**

69. *Phonapate* (Lesne) *frontalis* Fahraeus v. *uncinata* Karsch.

14 ♀♀ vom südl. Oued Mya, im Mai 1912. Von Touggourt bekannt. 1 ♂, El-Arich, S.W. von Touggourt, 8. vi. 1912.

70. *Bostrychopsis* (Lesne) *Reichei* Mars.

7 ♀♀ Ex., Oued Nssa, Ghardaia—Guerrara, 3–5. vi. 1912. Auch Senegal, Abyssin., Aegypt.

71. *Xylonites* (Lesne) *praeustus* Germar.

1 Ex., Oued Nssa. Auch Gall. m., Dalmat., Sicilia.

72. *Enneadesmus* (Marsl.) *forficula* Fairm.

5 Ex. Oued Mya, 4 Ex. Oued-Nssa, El-Arich, S.W. Touggourt, 8. vi. 1912 ; 2 Ex. nördl. von El-Golea, v. 1912, 2 Ex. Auch aus Biskra und Tunis bekannt.

#### **LYCTIDAE.**

73. *Lyctus* (L.) *cornifrons* Lesne.

S. Oued Mya, 5 Ex.

#### **ANOBIIDAE.**

† 74. *Xyletinus* (Latr.) *bucephalus* Illig.

El-Meksa, südl. von El-Golea, 2. iv. 1912., Tougg.—El-Oued, je 1 Ex. Auch Hisp. m., Lusit., Gall. m., Italia.

† 75. *Lasioderma* (Steph.) *Redtenbacheri* Bach.

Süd Oued Mya, 1 Ex. Von Deutschland bis Süd-Frankreich und Russland, Caucas., verbreitet.

#### **OEDEMERIDAE.**

(Von Bedel bestimmt.)

76. *Xanthomima* (Fairmaire) *obsoleta* Fairm. = Handlirschi Seidlitz  
= Boissyi Ancy.

5 Ex. gefunden von Hartert, 50 km. nördlich von In-Salah, an toten Traganum Pflanzen (Domrahn). Eines der Ex. in coll. Heyden. *X. obsoleta* Fairm. ist beschrieben *Ann. Belge*, 1894, 312, von Ouargla. *Ananconia Handlirschi*, Seidl. Erichs. *Ins. Deut.*, 1899, 832, aus Algerien. *X. Boissyi* Ancy, *Micell. Ent.* viii. 1900, 140 von Biskra,

77. *Sessinia* sp.

4 Ex. nördl. von El-Golea, v. 1912, 2 Ex. Touggourt—Oued iv. 1909, 2 Ex. in coll. Heyden. Die Gattung (Pascoe i.l.) ist aufgestellt von Semenov, *Horae* xxvii. 455, auf *Nacertes livida* F. von Taiti. Bedel schreibt mir: "Voisin mais différent de *S. fuscostrigosa* Fairm., *Rev. Mag. Zool.* 1879, 203, von Souf; *carinata* Karsch Berl. 1881, p. 50, t. 2, fig. 9. Peut-être par Pic dans un de ses nombreux travaux?"

**ANTHICIDAE.**

(Bearbeitet von Ritter von Krekich-Strassoldo in Wien.)

78. *Mecynotarsus* (Laferté) *semicinctus* v. *algericus* Desbr.

Oued Nssa (Ghardaïa—Gnerrara), 3–5 Juni. 9 Ex.

79. *Formicomus* (Laferté) *Brisouti* Pic.

Biskra, 1 Ex.

80. *Anthicus* (Paykul) *debilis* Laf.

Südlichster Oued Mya, Mai 1912. 1 Ex.

† 81. *Anthicus* *hamicornis* Mars.

Nördlich von El-Golea, 2 April 1912. 1 Ex.

82. *Anthicus* *velatus* Mars.

Südlichster Oued Mya, Mai 1912. 1 Ex.

Diese bisher nur aus Arabien und Aegypten bekannte Art scheint viel verbreiteter und in einem grossen Teile Nordost-Afrikas heimisch zu sein. Das Kgl. Museum in Berlin besitzt ein Exemplar aus Abyssinien.

83. *Anthicus* *harenosus* Krekich n.sp.

Dem *Anthicus sabuleti* Laf. in Färbung, Punktierung und Form des Kopfes sehr ähnlich, gestreckter, glänzend, ganz rotbraun, die Flügeldecken etwas heller, manchmal um das Schildchen, dann auch in der Mitte der Flügeldecken, an den Seiten und längs der Naht bis zur Spitze undeutlich und leicht gebräunt; am ganzen Körper mit kurzen, etwas abstehenden Haaren ziemlich dicht besetzt.

Kopf quer, etwas breiter als lang, hinten gerade mit kurz abgerundeten Ecken und (von der Seite gesehen) ziemlich schneidelförmig vorgezogen. Kein Mitteleindruck an der Basis. Punktierung stark und etwas zerstreut bis auf die glatte enge Mittellinie; auch der Basalrand ist glatt, unpunktirt. Augen ziemlich gross und vorstehend, Schläfen etwas vorgezogen, von der Länge der Augen. Fühler die Schultern erreichend, mit ziemlich gleichlangen Gliedern; Endglied doppelt so lang als das 10. Glied, kegelförmig, spitz.

Halschild breiter als der Kopf mit deutlichem Halse, etwas weniger breit als lang, herzförmig, vor der Basis verengt, Basalrand deutlich; davor ist das Halschild in der Mitte schwach und kurz längs-eingedrückt, so dass die Basis vor dem Basalraude zwei schwache Erhabenheiten (undeutlicher als bei *Cyclodinus* der Gruppe V. Marscul's) zeigt. Mit ocellierten, ziemlich seichten Punkten sehr dicht besetzt.

Flügeldecken an der Basis kaum um die Hälfte breiter als das Halsschild, fast dreimal so lang als breit, ziemlich parallel, nur vom zweiten Drittel an gegen die Spitze mässig breiter, weniger dicht aber tiefer punktiert als auf dem Kopfe und Halsschilde (die Punktierung gegen die Spitze abnehmend). Nahtstreifen in der Apicalhälfte fein erhaben mit deutlichem Eindrücke zu beiden Seiten des Nahtstreifens. Spitzen der Flügeldecken in beiden Geschlechtern gemeinsam gerundet.

Beine nicht sehr lang, Schenkel ziemlich verdickt. Tarsen stark behaart. Vorletztes Tarsenglied deutlich herzförmig.

♂ an dem gerade abgestutzten gerandeten Pygidium kenntlich. 3–5 mm. Zwischen Oued Nssa und Ghardaïa—Guerrara, 3–5. vi. 1912. 6 Exempl., davon je 1 Ex. in coll. Krekich und Heyden.

Von *A. sabuleti* durch die einfachen Hintertibien des ♂ und durch das breitere herzförmigere Halsschild verschieden. Mit *A. saharensis* Chob. verwandt. Dieser hat jedoch viel kräftigere Füße und ist viel dichter punktiert, fast chagriniert, hat daher ein mattes Aussehen.

Vielleicht ist *A. harenosus* nur eine Varietät des mir unbekanntes *A. littoralis* Woll.

#### 84. *Anthicus Goebeli* Laf.

Oued Nssa (Ghardaïa—Guerrara) 3–5. vi. 1912. 6 Ex.

*A. Goebeli* ist die Wüstenform des im ganzen Mittelmeergebiet weit verbreiteten *A. transversalis* Villa (= *tenellus* Laf.) und kommt ebenso in der Sahara und der lybischen Wüste, wie auch in den der raschen Austrocknung entgegengehenden Teilen Transkasiens vor. Diese Art ist offenbar noch in der Entwicklung begriffen und sind alle möglichen Übergänge zwischen *A. transversalis* und *A. Goebeli* aus der gleichen Gegend festzustellen.

Als extremste Wüstenformen sind die var. *buchariensis* Pic aus Turkestan und var. *meridionalis* Pic aus Algier und Tripolis, endlich *A. modestus* Laf. aus Arabien und Aegypten anzusehen.

*A. ornatus* Truqui aus Cypern und Syrien stellt einen schon vor längerer Zeit vom Hauptstamme *tenellus* abgezweigten Ast dar, während dies vom *A. araxicola* Reitt. aus dem Araxestale in noch höherem Masse gilt.

#### † 85. *Anthicus ophthalmicus* Rottenb. = *megalops* Mars.

Südlicher Oued Mya, Mai. 1 Ex.

Ich benütze diesen Anlass, um die Synonymie des *A. megalops* mit *A. ophthalmicus* festzustellen. Das Hofmuseum in Wien besitzt ein Exemplar des *ophthalmicus* aus Sicilien und ich habe Grund zur Annahme, dass es direkt aus dem Besitze Rottenberg's stammt. Da dieses Tier, soweit mir bekannt, seither in Sicilien nicht mehr gesammelt worden ist, dürfte das von Rottenberg in einem trockenen Flussbette bei Catania gefundene Exemplar durch Verschleppung dahin gekommen sein. Nicht ausgeschlossen ist es allerdings, dass es sich um ein Relikt aus der Zeit, da Sicilien mit Nordafrika verbunden war, handelt. *A. megalops* ist auch in Nordafrika selten. Der *A. ophthalmicus* des Wiener Hofmuseums stimmt nicht nur mit der Beschreibung und Zeichnung Rottenberg's, sondern auch mit der verglichenen Type des *megalops* aus der Marscul'schen Sammlung auf das Genaueste überein.

#### † 86. *Anthicus laeviceps* Mars.

Nördlich von El-Golea und im südlichsten Oued Mya im Mai 1912. 2 Ex.

87. *Aulacoderus* (Laferté) *sulcifer* Pic und var. *miniaticollis* Pic.  
Nördlich von El-Golea im Mai 1912. 49 Ex.

88. *Anthicus inoblitus* Krekich, n.sp.

Glänzend, ganz gelb, mit einer mehr oder minder dunklen, braunen, wenig begrenzten, den Seitenrand kaum erreichenden Querbinde im Apicalviertel.

Kopf ins Dunkelrote spielend, länglich, an der Basis kreisrund, ziemlich konvex, nach vorne flacher; an der Stirne, etwas vor den Fühlerwurzeln, mit einer ziemlich geraden, nicht tiefen Querlinie. Punktierung schwach, zerstreut nur an der Stirne etwas dichter. Augen gross, eiförmig, stark facettiert. Schläfen kurz. Behaarung licht, sehr schwach. Fühler die Schultern erreichend, mässig kräftig; 2. Glied dicker und kürzer als das 3.; die 5 Endglieder mässig verdickt, letztes Glied fast dreimal so lang als das 10.; zugespitzt.

Halsschild ein wenig breiter als der Kopf, so lang als breit, mit sehr starkem, von der Basis entferntem ziemlich geraden Quereindrucke (der sich gegen die Seiten zu sehr vertieft); dieser, namentlich an den Seiten, mit langen lichten, kräftigen Haaren dicht besetzt. Punktierung seicht und zerstreut. Beim ♀ ein kleines, deutlich abstehendes Zäpfchen zu beiden Seiten des Halsschildes.

Flügeldecken an der Basis fast doppelt so breit als das Halsschild,  $2\frac{1}{2}$ -mal so lang als breit, hinter der Mitte etwas erbreitet, Spitzen beim ♀ quer gerundet, beim ♂ schräger mit einem kleinen Dorn nicht weit vom Nahtende. Mit dichten, feinen, ziemlich langen, zum Teile etwas abstehenden Haaren besetzt. Punktierung überall, seicht, zerstreut.

Beine länglich, wenig kräftig, Schenkel nicht verdickt. Hintertibien des ♂ etwas nach innen eingebogen.

3 mm. S. Oned-Mya, Mai 1912. 6 Ex., davon je 1 Ex. in coll. Krekich und Heyden.

Mit *A. Bouvieri* Pic aus Obok und *Citernii* Pic aus Somaliland durch das seitliche Zäpfchen am Halsschilde nahe verwandt; von beiden durch die konstante grössere Gestalt und durch die Zeichnung der Flügeldecken (*Bouvieri* hat nur eine Nahtmakel nahe der Spitze, *citernii* eine gezackte Querbinde hinter der Mitte) verschieden; *A. inoblitus* unterscheidet sich überdies von *A. Bouvieri* durch den breiteren Halsschild und die schwächere Punktierung des Halsschildes und der Flügeldecken, von *A. citernii* durch den geraden Quereindruck am Halsschilde.

*A. inoblitus* hat eine gewisse Ähnlichkeit mit dem *A. sefrensis* Pic aus Algier (Aïn-Sefra), er ist aber grösser und überdies durch die hellgelbe Färbung, durch die feinere zerstreute Punktierung und durch die anliegendere Behaarung von *A. sefrensis* verschieden. Ob das ♀ von letzterem ebenfalls ein Zäpfchen an den Seiten des Halsschildes hat, konnte ich nicht constatieren, da alle 7 Exemplare in meinem Besitze ♂ sind. Doch dürfte dies nicht anzunehmen sein, weil in der Beschreibung davon keine Erwähnung geschieht. Auch bei der n. sp. scheint das ♀ seltener zu sein (unter 6 Exemplaren nur 1 ♀).

(Wien im Dezember 1912.)

#### MELOIDAE.

89. *Mylabris* (F.) *Paykuli* Billbg.

Nördl. von El-Golea, v. 1912, 3 Ex. Von Algier, Tunis, Aegypt. und Arabien bis Syrien verbreitet.



90. **M. Henoni** Fairmaire.

Ouargla—El-Golea, 17–19. iii. 1912, zwei Ex.; Oued Nssa, Ghardaïa—Guerrara, 3–5. vii. 1912, 1 Ex.

91. **M. menthae** Klug.

Oued-Nssa, 1 Ex. Auch in Aegypt. Fayum.

† 92. **M. impressa** Chevrolat.

Biskra, 1 Ex. Auch in Portugal.

93. **M. batnensis** Marseul.

Nördl. von El-Golea, v. 1912. Seither nur von Batna bekannt.

94. **M. oleae** Castelnau, var. **Harterti** Pic nov. var.

Von Pic beschrieben, *Echange*, Dec. 1912, p. 90, nach unicum in der Sammlung : “*Elytris rubris, post medium nigro fasciatis et ad apicem nigris.* Oued Nssa, entre Ghardaïa et Guerrara. Hartert in Mus. Britannico, Londres. Communiqué par l’intermédiaire du Major Lucas von Heyden. Voisin de la var. *rimosa* Marsl., en diffère par l’oblitération de la bande antérieure noire des élytres.”

95. **Epicauta** (Redtb.) **sanguiniceps** Fairmaire.

Biskra, 1 Ex. Beschrieben *Ann. France Bull.* 1885. 38. Nur von Biskra bekannt.

**MORDELLIDAE.**

96. **Pentaria** (Mulsant) † **Defarguesi** Abeille, var. **unifasciata** Chobaut.

Oued-Nssa, Ghardaïa—Guerrara, 3–5. vi. 1912, ein Ex. Die Stammart beschrieben *Rev. Ent.* 1885, 161, von Hyères, Süd-Frankreich, die var. *Ann. Fr. Bull.* 1897. 133. von Algier.

**ALLECULIDAE.**

97. **Mycetocharina** (Seidlitz) **megalops** Fairmaire.

Ein grosses Ex. (6½ mm.) vom südl. Oued Mya, v. 1912, und 5 kleinere (5 mm.), je 2 Ex. nördl. von El-Golea, v. 1912; und Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912. Von Pic bestimmt. Von Ghardaïa und Ouargla beschrieben, *Ann. Belg.* 1894. 311.

98. **Heliotaurus** (Mulsant) (**Julogenius** Reitter) **Reichei** Muls. (**oranensis** Reitt., **Grilati** Muls.).

Laghouat, iv. 1911, ein Ex. In Algier weit verbreitet, vide Bedel in *Abeille*, 28. 1894. 172.

99. **H. angusticollis** Muls.

3 Ex. von Biskra. Auch Tunis. Bedel erwähnt Biskra.

**TENEBRIONIDÆ.**100. **Zophosis** (Latreille) **plana** F. (Schönherri Solier).

Südlichster Oued Mya, 2 Ex.; In-Salah, Tidikelt, 21–30. iv. 1912, einmal. Auch Aegypt., Nubien.

101. **Z. approximata** Deyrolle.

Biskra, 4 Ex. Nur daher bekannt.

102. **Z. curta** Deyrolle.

Laghounat, iv. 1911, einmal gefunden.

103. **Erodius** (F.) **exilipes** Lucas.

Onargla—El-Golea, 17–19. iii. 1912, 2 Ex.; El-Arich, S.W. Touggourt, 8–9. vi. 1912, 2 Ex.; Touggourt—El-Oued, iv. 1909, 2 Ex. Seltene Art. Durch rippenlose Decken ausgezeichnet.

104. **E. Lefrancei** Kraatz.

S. Oued Mya, 2 Ex.; In-Salah, Tidikelt, 24–30. iv. 1912, 2 Ex.; Touggourt—El-Oued, 1 Ex. Auch von Biskra und Laghouat bekannt.

105. **E. bicostatus** Solier.

Je einmal von Biskra und Onargla—El-Golea, 17–19. iii. 1912. Auch bei Bou-Saada und in Tripolis.

106. **E. antennarius** Vauloger var. **deserticola** Vauloger.

3 Ex. je einmal nördl. von El-Golea, v. 1912; Bordj Chegga—Kef-el-Dor, 22. iii. 1912; Onargla—El-Golea, 17–19. iii. 1912. Beschrieben *Ann. Fr. Bull.* 1897. 307. Stammart: Kreider (Oran), var. von Laghouat—Ghardaïa.

107. **Adesmia** (Fischer) **acervata** Klug.

Biskra, 5 ♂♂, 4 ♀♀; S. Oued Mya, v. 1912, 9 ♂♂, 14 ♀♀. Auch in Aegypt. —*Biskrensis* Luc. ist dieselbe Art.

108. **A. Douei** Lucas.

• Je 1 ♂ von El-Arich, S.W. Touggourt, 8–9. vi. 1912; Oued Mya, v. 1912; Biskra, 4 ♀♀ Oued Mya.

109. **A. Faremonti** Luc.

2 ♂♂, 1 ♀ Biskra; 1 ♀ Laghouat, iv. 1911. Aus Algier beschrieben. Allard gab Classification: *Ann. Fr.* 1885. 155.

110. **Mesostena** (Eschscholtz) **longicollis** Lucas.

Nördl. von El-Golea, v. 1912, 4 Ex.; Onargla—El-Golea, 17–19. iii. 1912, 5 Ex.; S. Oued Mya, v. 1912, 2 Ex. Von Touggourt, auch Tunis, beschrieben.

111. **Pachychile** (Eschscholtz) **glabra** Steven, var. **emarginata** Desbr.

3 Ex., von Biskra. Häufig in Algerien. Desbrochers beschrieb 5 var. in *Bull. Académie Hippone* 1881. 11.

112. **Tentyria** (Latreille) **Kantarae** Fairmaire.

Je einmal nördl. von El-Golea, v. 1912, und S. Oued Mya, v. 1912. Von El-Kantara beschrieben.

113. **T. Mulsanti** Lucas.

1 ♂ ♀, Biskra.

114. **Micipsa** (Lucas) **striaticollis** Luc.

♂ mit langem Endglied der Fühler. 2 ♂♂, 2 ♀♀, Ouargla—El-Golea, 17–19. iii. 1912.

115. **M. gracilipes** Fairm.

Ein ♂ ♀ ebenda. Sehr selten. Fehlte coll. Heyden. Beschrieben *Ann. Genova* 1875. 522.

116. **Himatismus** (Erichson) **saharensis** Chobaut.

S. Oued Mya, v. 1912, 2 Ex.; El-Meksa, südl. von El-Golea, 2. iv. 1912, 2 Ex.; nördl. von El-Golea, v. 1912, 11 Ex.

117. **H. Lapegrandi** Motschulsky.

9 Ex., El-Golea, v. 1912. (Ich kann die Beschreibung nicht finden.)

118. **Akis** (Herbst) **biskrensis** Reitter.

Touggourt, April 1909, einmal. Von Biskra beschrieben, *Bestimm. Tab.* 53. 1904. 43.

119. **Scaurus** (Fabricius) † **calcaratus** F. (**tristis** Oliv.).

Einmal, S. Oued Mya, v. 1912. Süd Europa verbreitet.

120. **S. aegyptiacus** Solier.

Einmal, nördl. von El-Golea, v. 1912. Von Alexandria beschrieben.

121. **S. Varvasi** Solier.

Einmal, Ouargla—El-Golea, 17–19. iii. 1912. Von Bona beschrieben.

†122. **S. sticticus** (Gemgr.) (**punctatus** Hbst.).

Einmal, Bordj Chegga, 22. iii. 1912. S. Europa häufig.

123. **Blaps** (Fabricius) **Wiedemanni** Solier.

El-Golea, 17–19. iii. 1912. In Aegypten und Algier

124. **Prionotheca** (Sol.) **coronata** Solier.

In-Salah, Tidikelt, 24-30. iv. 1912, 3 Ex.; Touggourt—El-Oued, iv. 1909. Auch Aegypt., S. Abyssinien.

† 125. **Ocnera** (Fischer) **hispida** Forskal.

Bordj Chegga, 22. iii. 1912, 4 Ex.; Ouargla—El-Golea, 17-19. iii. 1912, 3 Ex.; S. Oued Mya, v. 1912, einmal; Touggourt—El-Oued, iv. 1909, 1 Ex. Auch in Aegypt., Syrien, Arabien, und Sicilien.

126. **Euthriptera** (Reitter) **griseascens** Fairm. (**piceola** Desbr.).

Zwei Ex., Touggourt, April 1909. Auch Tunis.

127. **Thriptera** (Solier) **Bedeli** Allard.

S. Oued Mya, v. 1912, einmal.

128. **Pimelia** (F.) subg. **Pisterotarsa** (Motsch.) **anomala** Sénac.

Touggourt, April 1909, 1 Ex.; El-Golea, v. 1912, 4 Ex. Von Bou-Saada beschrieben 1880, *Ann. Fr. Bull.* 56, *Essai Monogr.* 1884. 14.

129. **P.** (P.) **Theveneti** Sénac.

Einmal, Ouargla—El-Golea, 17-19. iii. 1912. Von Suez beschrieben.

130. **P.** (P.) **retrospinosa** Lucas.

Ein Ex., Touggourt—El-Oued, iv. 1909. Nach Sénac Hauptfundort, zuerst von Laghouat bekannt geworden.

131. **P.** (P.) **confusa** Sénac.

Touggourt—El-Oued, iv. 1912, 5 Ex.; zweimal von Bordj Chegga, 22. iii. 1912. S. Algier weiter verbreitet, Sénac führt auch Chegga an.

132. **P.** (P.) **consobrina** Lucas.

Nördl. von El-Golea, v. 1912, 2 Ex.; Ouargla—El-Golea, 17-19. iii. 1912, 1 Ex.; In-Salah, Tidikelt, 24-30. iv. 1912, 9 Ex. Auch von Biskra, Laghouat, Tunis bekannt.

133. **P.** (P.) **interstitialis** Solier.

Biskra einmal. Daher schon bekannt, auch Tunis.

134. **P.** (**Melanostola** Solier) **gibba** F. Gebien (**simplex** Solier).

1 Ex., Biskra. Wüstenart. Auch Tunis, Tripolis.

135. **P.** **Latastei** Sénac.

Biskra, 5 Ex.; S. Oued Mya, v. 1912, 1 Ex.; In-Salah, Tidikelt, 24-30. iv. 1912, 1 Ex. Biskra und Ouargla sind bekannte Fundorte.

136. **P.** **Boyeri** Solier.

Biskra einmal. In ganz Algier und Tunis häufig.

137. *Leucolaephus* (Lucas) **Perrisi** Lucas.

14 Ex. nördlich von El-Golea, v. 1912. *Ann. Fr. Bull.* 1859, p. 23. Scheint Art und nicht ♀ von *nigropunctatus* Luc. zu sein, wie Reitter *Best. Tabelle* 25, 59 angiebt. Die Decken sind grau beschuppt mit deutlichen kahlen Längstreifen.

138. *Sepidium* (F.) **Requieni** Solier.

Biskra, 4 Ex. Auch aus Laghouat und Boghari bekannt.

139. *S. variegatum* F. Solier.

Boghari, 29. iv. 1911, 2 Ex. In Algerien verbreitet, auch Tunis.

† 140. *Scleron* (Hope) **armatum** Waltl.

Biskra, 2 Ex. Auch Andalusien, Sicilien.

† 141. *Anemia* (Laporte) **sardoa** Géné.

Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, Sandtier, 89 Ex.; einmal El-Arich, S.W. Tonggourt, 8–9. vi. 1912. Auch S. Europa: Sardinia, Graecia, Marocco, Syria, Armenia: Araxes. Reitter, *Best. Tabelle* 53. [Kamen im O. Nssa zu Hunderten an die Lampe.—E. H.]

142. *A. fissidens* Reitter.

Nördl. von El-Golea, v. 1912, 88 Ex.; El-Meksa, südl. von El-Golea, 17 Ex.; S. Oued Mya v. 1912, 6 Ex.; In-Salah, Tidikelt, 2 Ex.; El-Meksa, südl. von El-Golea, 5 Ex. Aus Ghardaïa (Mzab) beschrieben.

143. *A. Chobauti* Reitter.

Oued Nssa, Ghardaïa—Guerrara, 3–5. vi. 1912, 46 Ex. Beschrieben wie vorige aus Ghardaïa, *Best. Tab.* 53. 130.

† 144. *Gonocephalum* (Chevrolat) **rusticum** Olivier.

Nördl. von El-Golea, 5. 1912, 10 Ex.; Oued Nssa, Ghardaïa—Guerrara, 3–5. vi. 1912, 2 Ex. Häufig in N. Africa und Süd Europa.

† 145. *Opatroides* (Brullé) **punctulatus** Brullé.

S. Oued-Mya, v. 1912, ein Ex. Im Mittelmeergebiet weit verbreitet.

146. *Crypticus* (Latr.) subg. *Seriscius* (Motsch.) **nebulosus** Fairmaire.

3 Ex. vom Oued Nssa, Ghardaïa—Guerrara, 3–5. vi. 1912. Auch aus Boghari und Mogador bekannt.

† 147. *Tribolium* (MacLeay) subg. *Stene* (Stephens) **confusum** Duval.

In-Salah, Tidikelt, 24–30. iv. 1912, 13 Ex. In Europa, besonders im Süden und Nordafrika, meist mit Getreide und Mehl verschleppt.  
[Fand sich in grosser Menge in den Häusern im Fort.—E. H.]

**CERAMBYCIDAE.**

148. **Polyarthron** (Serville) **pectinicornis** F., **Rasse Fairmairei** Pic (**barbarum** Pic non Lucas).

2 ♂♂, Touggourt 1909. Wüstentier. Lebt in Wurzeln der Dattelpalme. Siehe Lameere, *Ann. Belge* 1912. 228. In Nordafrika in 12 Rassen. Stammart Süd-Oran, Marocco, Senegal. [Wir fingen die Art nicht selbst, erhielten aber eine Flasche voll in Spiritus, worunter aber nur ein ♀.—E. H.]

149. **Apatophysis** (Chevrolat) **toxoides** Chevr.

3 ♂♂ : 2 nördl. von El-Golea, v. 1912, 1 von Bordj Chegga, S. Biskra, 22. iii. 1912. Wüstentier.

150. **Plocaederus** (Thomson) **Caroli** Leprieur.

S. Oued Mya, 7. iv., nördl. von El-Golea, 22. v. 1912; El-Meksa, südl. von El-Golea, 2. iv. 1912, 2 Ex.; Touggourt—El-Oued, iv. 1909, 4 Ex. Beschrieben *Ann. Fr. Bull.* 1876. 8. von Hodna, auf *Calligonum comosum*.

151. **Tetropiopsis** (Chobaut) **Guldei** Chobaut.

1 Ex. nördl. von El-Golea, v. 1912. Das zweite bekannte Ex., Orig. in coll. Heyden, beschrieben *Ann. Fr. Bull.* 1905. 157. von El-Kantara. Siehe auch über die Gattung, loco cit. 1902. *Bull.* 26. Lameere.

152. **Neomarius** (Fairmaire) **Gandolphei** Fairm.

1 Ex. von Bedel bestimmt, vom S. Oued Mya, v. 1912. Beschrieben *Rev. Zool.* 1872. 60. wo es aber nach Bedel heissen muss Long. 13 millm. (non 23). Siehe auch Reitter, *Wien. Ent. Z.* 1882. 137. In Süd Frankreich eingeschleppt.

† 153. **Agapanthia** (Serville) **irrorata** F. var. **granulosa** Chevr.

Hammam Rirha v. 1911. Auch Andalusien. [Nicht selten an blühenden Pflanzen Ende Mai.—E. H.]

† 154. **A. annularis** Oliv.

Ebendaher 6 Ex. Auch Spanien.

155. **Conizonia** (Fairmaire) **vittigera** F.

Ebendaher 4 Ex.

† 156. **Phytoecia** (Mulsant) subg. **Opsilia** (Muls.) **virescens** F.

Ebenso. Europa überall.

**CHRYSOMELIDAE.**

† 157. **Macrolenes** (Lacord.) **dentipes** Oliv.

1 ♂ von Hammam Meskoutine, v. 1911. ♀ = *salicariae* Ménétr. Biskra einmal, Oued Nssa, Ghardaïa—Guerrara 3-5. vi. 1912. 2 Ex. Süd Europa häufig.

158. **Tituboea** (Lac.) **Paykuli** Lacordaire.

Nördl. von El-Golea v. 1912, Biskra je einmal.

v. **fasciata** Lefèvre.

Oued Nssa, Ghardaïa—Guerrara, 3–5. vi. 1912, 1 Ex. Die Art in Algier verbreitet.

† 159. **Cryptocephalus** (Geoffrey) **rugicollis** Ol. v. **humeralis** Oliv.

Biskra, 4 Ex. Häufig in Süd-Europa.

160. **Pseudocolaspis** (Chapuis) **seriemicans** Reitter.

6 Ex. nördl. von El-Golea, v. 1912.

† 161. **Phytodecta** (Kirby) (subg. **Spartiophila** Chevr.) **variabilis** Oliv.  
v. **spartii** Oliv.

1 Ex. nördl. von El-Golea v. 1912. Häufig in Süd-West Europa.

† 162. **Crepidodera** (Chevrolat) **impressa** F.

Biskra, 1 Ex.

† 163. **Chaetocnema** (Stephens) **hortensis** Geoff.

Biskra, 1 Ex. Beide Europa häufig.

**BRUCHIDAE.**

† 164. **Caryoborus** (Schönherr) **pallidus** Oliv. = **acaciae** Gyll.

S. Oued Mya, v. 1912. Ein Ex. Auch in Portugal, Dalmatien, Griechenland, Süd-Russland.

**CURCULIONIDAE.**

165. **Leucosomus** (Motschulsky) **insignis** Desbrochers.

Biskra, 1 Ex. Von daher beschrieben *Bull. Hippon.* 1884. 154.

† 166. **Coniocleonus** (Motsch.) **riffensis** Fairmaire (**fasciculosus** Reitter).

Biskra, 1 Ex. Fairm. beschrieb die Art *Naturaliste* Deyrolle 1884. 446, aus Andalusien. Auch von S. Portugal: Faro und Balearen bekannt.

† 167. **Conorrhynchus** (Motsch.) (subg. **Temnorhinus** Chevr.) **conicirostris** Oliv.

Einmal El-Arich, S.W. Touggourt, 8–9. vi. 1912. Auch in Süd-Spanien.

168. **Dicranotropis** (Faust) **hieroglyphicus** Oliv.

Je 1 Ex. von Biskra, El-Meksa, südl. von El-Golea 2. iv. 1912; El-Arich, S.W. Touggourt, 8–9. vi. 1912. Auch Aegypt, Syrien.

169. *Stephanophorus* (Faust) *anxius* Gyll. (*basigranatus* Fairm.).

Ouargla—El-Golea, 17–19. iii. 1912; 2 Ex.; Arefidji, nördl. von Ouargla, 6. iii. 1912. Aus Persien zuerst beschr. dann von Fairm. *Ann. France*, 1868. 495, von Constantine in Algier.

170. *Lixus* (F.) (subg. *Phillixus* Petri) *rectirostris* Desbr.

5 Ex. El-Arich, S.W. Touggourt, 8–9. vi. 1912. Beschrieben Frelon, xii. 1904. 74, aus Biskra nach einem Ex.

171. *Phytonomus* (Schönherr) *isabellinus* Boheman.

Je einmal von El-Arich, S.W. Touggourt, 8–9. vi. 1912, und N. El-Golea, v. 1912. Aus Arabien, Aegypt. bekannt.

**SCARABAEIDAE.**172. *Glaresis* (Erichson) *Handlirschi* Reitter.

Ouargla—El-Golea, 17–19. iii. 1912, 12 Ex.; nördl. von El-Golea, 6 Ex. Je einmal von Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912.; El-Arich, S.W. Touggourt, 8–9. vi. 1912; Laghouat, iv. 1911. Beschrieben *Bestimmungs-Tabelle* 24, 1892, 223, vom Chott Melrhir.

173. *Aphodius* (Illiger) (subg. *Erytus* Mals.) *lucidus* Klng.

Nördl. von El-Golea, v. 1912, 8 Ex.; Ouargla—El-Golea, 17–19. iii. 1912, 4 Ex.; Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 2 Ex.; Touggourt—El-Oued, iv. 1909. Auch in Arabien, Central Asien, Canaren.

174. *A.* (E.) *opacior* Koshantshikov (*opacus* Reitter, non Leconte).

Nördl. von El-Golea, v. 1912, 5 Ex.; Ouargla—El-Golea, 17–19. iii. 1912, 4 Ex.; Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 2 Ex.; Touggourt—El-Oued, iv. 1909; El-Meksa, südl. von El-Golea, 2. iv. 1912. Auch in Tunis.

175. *A.* (E.) *brunneus* Klng.

Nördl. von El-Golea, v. 1912, 2 Ex.; Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 3 Ex.; Touggourt—El-Oued, iv. 1909, El-Meksa, südl. von El-Golea, 2. iv. 1912, 1 Ex.; Oued Mya, v. 1912, 1 Ex.; In-Salah, Tidikelt, 24–30. iv. 1912, 1 Ex.; El-Arich, S.W. Touggourt, 8–9. vi. 1912, 4 Ex. Auch in Syrien, Caucasus, Transcaspien.

176. *A.* (E.) *sitiphoides* Orbigny.

Touggourt—El-Oued, iv. 1909, 2 Ex.; S. Oued Mya, v. 1912, 2 Ex.; In-Salah, Tidikelt, 24–30. iv. 1912, 1 Ex. Von d'Orbigny beschrieben Abeille, 28. 1896. 218, auch von Tunis Synopsis des Aphodiens d'Europe et Méditerranée.

† 177. *A.* (E.) *lividus* Oliv.

2 Ex. von Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912. Cosmopolit.



†178. **A. (subg. *Bodilus* Mulsant) *hydrochaeris* F.**

Touggourt—El-Oued, iv. 1909, 6 Ex.; Laghouat, 27. iv. 1901, 2 Ex. Süd Europa, Syrien, Caucasus, Sibirien.

†179. **A. (B.) *longispina* Küster.**

Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 12 Ex.; Touggourt—El-Oued, iv. 1909, 2 Ex.; nördl. von El-Golea, v. 1912, 3 Ex.; In-Salah, Tidikelt, 27–30. iv. 1912, 1 Ex.; Guelt-es-Stel, nördl. von Djelfa, 28. iv. 1911, 4 Ex. Süd Spanien, Marocco, Tunis.

†180. **A. (B.) *lugens* Crenzter.**

Onargla—El-Golea, 17–19. iii. 1912, 7 Ex. Auch Europa, Caucasus.

†181. ***Psammodyus* (Heer) *laevipennis* Costa.**

Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 7 Ex.; N. El-Golea, v. 1912, 1 Ex. Auch Süd-Frankreich, Süd-Europa, Syrien, Transcaucasien.

†182. ***Eremazus* (Mulsant) *unistriatus* Mulsant.**

Nördl. von El-Golea, v. 1912, 14 Ex.; Onargla—El-Golea, 17–19. iii. 1912, 2 Ex.; El-Meksa, südl. von Golea, 2. iv. 1912, 2 Ex.; Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 10 Ex.; Wüstentier. Auch Tunis, Arabien, Obok, Caucasus: Araxes.

183. ***Ochodaeus Harterti* Reitter nov. sp.**

Von Grösse und Form des *O. Solskyi* Semenov.

Einfarbig rostrot, nur die Augen und das Lateralgrübchen am Halsschilde schwarz.

Kopf dicht punktirt, unendlich behaart, Clypeus mit einem ziemlich stark entwickelten, vorn kantig begrenzten Hörnchen.

Halsschild von der Breite der Flügeldecken, licht punktirt, kaum behaart, mit einer vorn verkürzten Mittelrinne, die Seiten gerundet, ringsum kräftig gerandet, die Vorderwinkel eckig vorstehend, die hinteren abgerundet.

Schildchen länglich dreieckig die Seiten vorn parallel.

Flügeldecken länger als zusammen breit, ziemlich gleichbreit, hinten zusammen abgerundet, oben mit Punktstreifen, der Nahtstreif stärker eingedrückt, die Zwischenräume dicht rasselartig punktirt und **äusserst fein und kurz börstchenartig behaart**, die Nahtkante sehr schmal, fein geschwärzt, Seitenrand vorn länger, hinten kurz bewimpert.

Vorderschenkel mit zwei die Hinterschenkel mit einem kurzen hakigen Zahne, der innere Zahn der Vorderschenkel klein.

Vorderschienen am Aussenrande mit 2 Zähnen, der dritte, gegen die Basis zu schwach angedeutet.

Unterseite und Beine länger gelb behaart, Schienen breit. Long. 5–8 millm.

Dem *tuberculifrons* Reitter aus Aegypten zunächst verwandt, aber grösser, kürzer behaart, feiner punktirt, dunkler gefärbt und die Bewaffnung der Schenkel verschieden. 12 Ex. (davon 2 in coll. Reitter, 4 coll. Heyden) zwischen Onargla und El-Golea, 17–19. iii. 1912. Laghouat, iv. 1911, einmal.

† 184. **Hybosorus** (MacLeay) **Illigeri** Reiche.

Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, 18 Ex. ; El-Arich, S.W. Touggourt, 8–9. vi. 1912, 2 Ex. ; El Meksa, südl. von El-Golea, 2. iv. 1912, 7 Ex. Auch in Süd Europa, Kleinasien bis Turcmenien.

† 185. **Scarabaeus** (L.) **sacer** L.

Biskra, 2 Ex. ; El-Golea, v. 1912, 4 Ex. Süd Europa, Syrien, von Klein = bis Central-Asien. [Ungemein häufig im April bis Juni, aber südlich von El-Golea selten und bei In-Salah nicht bemerkt.—E. H.]

† 186. **S. puncticollis** Lucas.

Biskra, 1 Ex. ; El-Arich, S.W. Touggourt, 8–9. vi. 1912, 3 Ex. ; Bordj Chegga—Kef-el-Dor, 22. iii. 1912, 1 Ex. Spanien, N. Afrika, Kleinasien, Syrien, Armenien, Türkei. [Nur in der nördlichen Sahara bemerkt.—E. H.]

† 187. **Gymnopleurus** (Illiger) **Sturmi** MacLeay.

Biskra, 7 Ex. Nordafrika, Süd Europa bis Siebenbürgen.

188. **Onthophagus** (Latreille) **Bedeli** Reitter.

Biskra, 1 Ex. In Nordafrika verbreitet von Algier bis Alexandrien in Wüsten.

189. **O. nebulosus** Reiche.

Biskra, 1 Ex. Von Algier durch Nordafrika, durch Aegypten, Syrien bis Arabien verbreitet.

190. **O. gazella** F.

Je ein ♂ von El-Arich, S.W. Touggourt, 6–9. vi. 1912, und Oued Nssa (Ghardaïa—Guerrara), 3–5. vi. 1912, und 2 ♀♀ von letzterem Fundort. Durch Senegal, Nubien, Somali, Mozambique, Natal, Madagascar, Aden, Arabien, sind bis Indien verbreitet.

† 191. **Onitis** (F.) **Ion** Olivier.

Biskra, 3 Ex. In Süd-Europa und N.W. Afrika verbreitet. [Gemein bei Biskra.—E.H.]

192. **Amphicoma** (Latreille) subg. **Eulasia** (Truqui) **bombylius** F.

Alger, 1–16. v. 1912, 2 Ex. ; Guelt-es-Stel, nördl. von Djelfa, 28. iv. 1911, 1 Ex. Ueber Alger, Tunis, Marocco verbreitet.

193. **Rhizotrogus** (Serville) **eburneicollis** Raffray.

Hamam Meskoutine v. 1911.

194. **Amphimallon** (Berthold) **obscurum** Fairmaire (**brunneum** Fairm.).

Arefidji, N. Ouargla, 6. iii. 1912, 4 Ex. *A. obscurus* beschrieben, *Ann. Fr.* 1864, 240, Kabylie ; *A. brunneus*, *Ann. Fr.* 1870, 380, Alger.

195. **Pachydema** (Laporte) subg. **Flatipalpus** (Fairm.) **albolanosa** Fairmaire.

2 Ex. Arefidji, nördl. von Ouargla, 6. iii. 1912. Seltene Art, aus Biskra, *Ann. Fr.* 1879, 248, beschrieben. Eins der 3 Originale in coll. Heyden.

196. **P.** subg. **Phygotoxeuma** (Brenske) **peltastes** Marseul.

Biskra, 1 Ex., nur daher bekannt.

197. **Europton** (Marseul) **gracile** Mars.

El-Arich, S.W. Touggourt 8-9. vi. 1912, 76 Ex., nördl. von El-Golea, v. 1912, 4 Ex. Wüstentier. Von Marseul beschrieben, *Abeille* iv. 1867, 81, von Ouargla.

198. **E. confusum** Mars.

5 Ex., von Oued-Nssa (Ghardaïa—Guerrara), 3-5. vi. 1912. Beschrieben *Abeille* xvi. 1878, 60, von Laghout.

† 199. **Hoplia** (Illiger) **sulphurea** Lucas.

Biskra, 3 Ex. Auch in Andalusien: Ronda, von Heyden, 1868.

200. **Adoretus** (Laporte) **epistomalis** Chobaut.

S. Oned Mya, v. 1912, 5 Ex. beschrieben *Ann. Fr.* 1899. *Bull.* 38. nach 2 Ex., aus Touggourt.

201. **Anomala** (Samouelle) **ferruginea** Marseul.

Touggourt, El-Oned iv. 1909, 4 Ex., El-Golea iv. 1912, 1 Ex. Von Marseul in *Abeille* iv. 1867, 36, richtig in diese Gattung gestellt, in seinem Catalog zu *Hoplopus* verwiesen, welcher Ansicht Reitter in *Bestimmungstabelle* 51, 81 folgt, der die Art nicht in Natura kennt. Bedel sah diese Touggourt Stücke und setzt sie, *Ann. Fr. Bull.*, 1912, 375. wieder zu *Anomala*. Sahara algérien nach Marseul.

202. **Dicranoplia** (Reitter) **deserticola** Lucas (**Lucasi** Fairm. **pumila** Mars.).

Touggourt—El-Oued, iv. 1909, 3 Ex. *D. deserticola* wurde von Lucas in *Ann. Fr.* 1859, *Bull.* 53, als *Phyllopertha* aus Bou-Saada beschrieben. Fairmaire änderte, l. c., 1870, 378 den Namen in *Lucasi* wegen *deserticola* Fischer, die aber zu *Anisoplia* gehört. *Pumila* ist von Marseul als *Anisoplia* beschrieben in *Abeille* xvi. 1878, 68, aus Aegypten.

203. **Hoplopus** (Castelnau) **atriplicis** F.

Oued Nssa (Ghardaïa—Guerrara), 3-5. vi. 1912, 5 Ex.; El-Arich, S.W. Touggourt, 8-9. vi. 1912, 1 ♂. Auch aus Tunis bekannt. Bedel hat, angeregt durch meine Correspondenz, die Art genauer untersucht und die Resultate in dem neuesten Heft 18. 1912, *Ann. Fr. Bull.*, p. 375, über die Geschlechts-Unterschiede an den Hinterklauen mitgeteilt. Die innere Klaue ist bei ♂ behaart und Pygidium convexer; bei ♀ glatt. Auch aus Bou-Saada und Tunis bekannt. Es liegen vor 2 ♂♂, 4 ♀♀.

204. **H. (Hybalonomala Reitter) Bleusei** Chobaut.

3 ♂♂ Ouargla—El-Golea, 17–19. iii. 1912, 1 Ex.; El-Golea, v. 1912, 2 Ex. Bedel stellt loc. cit. die Reittersche Gattung (*Best. Tab. 51, 81.*) zu *Hoplopus*, weil der fehlen sollende Sporn der Innenseite der Vorderschienen doch fein vorhanden ist. Chobaut beschrieb seine *Anomala Bleusei* in *Ann. Fr. Bull.* 1896, p. 388, von Ain-Sefra.

205. **Pentodon (Illiger) variolosopunctatum** Fairmaire.

S. Oued Mya, v. 1912, 9 Ex. Beschrieben *Ann. Fr.* 1879, p. 172, von Laghouat. *P. pygidialis* Kraatz, *D.E.Z.* 1882, p. 61, ist dieselbe Art.

206. **Crator (Semenov) cuniculus** Burmeister.

Nördl. von El-Golea, 1 Ex.; Ouargla—El-Golea, 17–19. iii. 1912, 2 Ex.; Arefidji, nördl. von Ouargla, 6. vi. 1912. Beschrieben *Handbuch* v. 1847, p. 119, von Algier bis Senegambien verbreitet.

207. **Coptognathus (Burmeister) Lefrancei** Mulsant.

Ein ♂ vom Oued Mya; 2 ♀♀ Tonggourt—El-Oued, iv. 1909; 1 ♀ Arefidji, N. Ouargla, 6. vi. 1912. Beschrieben *An. Lyon.* 1865. 448. Von Algier bis Tripolis.

208. **Enoplatarsus (Lucas) deserticola** Lucas.

Je einmal vom Oued Nssa (Ghardaïa-Guerrara) 3–5. vi. 1912. und nördl. von El-Golea, v. 1912. Beschrieben *Ann. Fr. Bull.*, 1857. 56. Sahara algérien.

† 209. **Oxythyrea (Mulsant) funesta** Poda.

Biskra, 5 Ex. Ganz Europa, Caucasus.

210. **O. subcalva** Marscul (**biskrensis** Fairmaire).

Biskra, 5 Ex.

† 211. **Tropinota (Mulsant) crinita** Charpentier (**squalida** L. non Scopoli).

Biskra, 4 Ex., S. Oued Mya, v. 1912, einmal. Über ganz Süd Europa bis Syrien verbreitet.

† 212. **Potosia (Mulsant) opaca** F.

Biskra. Auch in Spanien und Marocco.

[Bei Biskra gemein.—E. H.]

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## VII.

## LEPIDOPTERA.

BY THE HON. WALTER ROTHSCHILD, PH.D., F.R.S.

THE collection is of considerable interest: firstly, it is the only larger collection from south of Biskra (Dr. Kranse's collection was much smaller) and south of Ouargla it is the first record we possess; and secondly, because it contains an extraordinary number of species which were originally described from such widely separated places as Socotra, Egypt, Turkestan, Persia, and India, besides 35 new species and 3 new subspecies. This is a proof that the true desert species are very widespread and that similar environment produces similar inhabitants.

The collection consists of 1509 Lepidoptera, several specimens of the larvae of *Papilio* and *Celerio*, a number of cases of the Psychid *Amicta murina*, and a number of galls of the Microlepidopteron *Oecocercis guyonella* Gn. There are 158 species, as follows: *Papilionidae*, 9; *Daniinae*, 1; *Nymphalidae*, 3; *Lycænidæ*, 4; *Hesperidae*, 1; *Sphingidae*, 3; *Lymantriidae*, 3; *Lasiocampidae*, 1; *Noctuidæ*, 59; *Geometridæ*, 14; *Arctiidae*, 1; *Psychidae*, 1; *Cossidae*, 2; *Pyralidae*, 52; *Microlepidoptera*, 5.

## RHOPALOCERA.

## PAPILIONIDÆ.

1. *Papilio machaon hospitonides* Oberth.

1 ♂, S. Oued Mya; 1 ♂, 1 ♀, Ghardaïa; 7 ♂♂, 1 ♀, El-Hadadra, between El-Golea and Ghardaïa.

The eleven specimens are indistinguishable from Biskra specimens, and two half-grown larvae agree entirely with Oberthür's figure (*Etudes*, xii. Pl. V.). As I have never seen half-grown larvae from the Bou-Saada-Laghouat region, and both adult larvae and bred imagines from Bou Saada differ somewhat from the present series and our Biskra examples, I, for the time being, do not care to unite *P. m. hospitonides* and *P. m. saharae* Oberth. described from Laghouat. Should they hereafter prove identical, which is very probable, the name *saharae* has priority.

Dr. Seitz is quite wrong in treating *hospitonides* and *saharae* as aberrations of *machaon*; they are certainly a good local race, if not two. They differ from the northern Algerian *machaon sphyrus (asiatica)* Oberth. and Seitz, nec Mén.) in their usually uniformly small size, deeper canary-yellow colour, much larger submarginal yellow patches, narrower black bands, and thinner, more acute, tails. There is also an indefinable yellowish bloom over most of the specimens not observable in examples from north of the Atlas. The larvae have longitudinal rows of separate black spots on a much paler apple-green ground; **not** transverse bands or rings of black on bright apple-green; as in *P. m. machaon*.

[For the first time we saw a single Swallow-tail near the Tilmas-Djilrhempt, in the bed of the Oued Mya, but the specimen was not caught. On the return

journey we saw two in the same neighbourhood, but obtained only one, on April 30. Later on, from El-Hadadra northwards to Ghardaïa, *P. machaon* was frequently seen, and at El-Hadadra (23. v.) and from Gâa to Sebseb (26. v.) it was quite common; but many specimens were battered and worn, so that only a few were taken. It was also seen in some numbers at Ghardaïa, and two were caught. It was always found along the "oueds," and was most commonly seen on the flowers of *Deverra scoparia*, a large plant with a strong smell somewhat between that of parsley and fennel. On the *Deverra* the caterpillars were also found, about half grown and smaller still, between El-Hadadra and Sebseb.—E. H.]

## 2. *Pieris rapae leucotera* Stef.?

3 ♂♂, Touggourt; 1 ♂, Bled-el-Ahmar; 1 ♂, El-Golea.

*Pieris rapae* is fairly abundant all over Algeria, though not nearly so much so as in Europe. South of the Atlas it occurs, as far as we know, all over the Sahara, but **exclusively** in the oases. Throughout its range both in the Palaearctic and Nearctic regions it is subject to much variation, individual as well as geographical, and the three generations are also distinct. *Pieris rapae rapae* form. vern. *metra* Steph. is the spring brood, form. aest. *rapae* Linn. is the summer brood, and form. aut. *leucosoma* Shaw is the third or autumn brood. Though the series in the Tring Museum numbers many hundreds of specimens, it is still woefully insufficient to enable a correct classification of this species to be made; so I have quoted the desert form under Dr. Stefanelli's name with a query. The great bulk of the specimens found south of the Atlas are characterised by the pale or almost obsolescent dark apex to the forewings, which on the upperside in the ♂ also rarely if ever show two dark spots. Those from north of the Atlas also have the black markings much more reduced than in European examples. If the many collectors of Palaearctic and Nearctic lepidoptera would only collect every common species in large series from each and every possible locality, we should be much sooner able to give a correct systematic and zoogeographical review of the Holarctic Fauna than will be possible for many years to come under present conditions.

[We only saw this species in the gardens of Touggourt, in the little oasis of Bled-el-Ahmar, near Touggourt, and at El-Golea; but I believe only three were seen altogether in the latter place, one of which was in a fair condition and preserved. This "white" was only seen in gardens where turnips, radishes, or cabbages were grown, its caterpillar doubtless living on some of these plants, though we found none.—E. H.]

## 3. *Pieris (Leucochloë) daplidice albidice* Oberth.

10 ♂♂, 13 ♀♀, El-Hadadra; 28 ♂♂, 5 ♀♀, Ghardaïa; 4 ♂♂, sands of El-Arich; 1 ♂, Bled-el-Ahmar; 1 ♂, Biskra; 1 ♀, El-Golea; 22 ♂♂, 3 ♀♀, South Oued Mya; 6 ♂♂, 1 ♀, north of Aïn Guettara.

This series of 95 specimens fairly illustrates the extraordinary variation both in size and colour in *daplidice* in the more southern portions of its range. South of the Atlas Mountains the colour of the underside of the hindwings ranges from dark yellowish olive-green with three rows of white spots, through many intergradations to white with canary-yellow cloud-like smears. The smallest ♂ has the forewing 17 mm. in length (Ghardaïa), while the largest has it 25 mm. (N. of Aïn Guettara); the smallest ♀ has a forewing of 19 mm. (Ghardaïa), and the

largest has it 26.5 mm. (El-Golea). Whether the form north of the Atlas requires a new name, or is identical with *P. d. raphani*, as Oberthür asserts, I cannot at present decide, as I have no specimens from north of Guelt-es-Stel and Khenchela.

Although in Europe the summer generations (in the north, form. aest. *daplidice*, and in the south, form. aest. *raphani*) show more yellow on the underside than their spring broods, they never show normally anything approaching the range of variation found in *P. d. albidice*.

[*P. daplidice albidice* was very common along the river-beds in the Mزاب country from Ghardaïa southwards to El-Hadadra, and eastwards of Ghardaïa, also not rare in the southernmost parts of the Oued Mya to about 35 kilometres north of Aïn Guettara. Everywhere fresh specimens were flying together with worn ones, and at Ghardaïa, at the end of May, it was difficult to catch faultless individuals.—E. H.]

#### 4. *Pieris (Leucochlöe) glauconome glauconome* Klug.

1 ♂, South Oued Mya; 1 ♀, north of Aïn Guettara.

This species is recorded from an enormous area—viz. from Egypt and East Africa, through Arabia, Persia and Cashmere to Thibet. In spite of this extraordinary distribution, only one local race has been separable—viz. *P. g. iranica* Bien. from Persia.

So far there are only two records from west of Egypt—viz. Dr. Hartert's specimens here mentioned and a specimen mentioned by Oberthür as having been taken by Roland Trimen at Constantine. This latter specimen I have not **personally** seen, but short of personal confirmation I cannot help remarking that the locality seems a most unlikely one, and the identification, therefore, may be due to confusion with one of the aberrant Algerian *daplidice* forms.

[The ♂ was a beauty, the ♀ rather tattered. No others were noticed.—E. H.]

#### 5. *Euchlōe belemia desertorum* Tur.

3 ♂♂, Bordj Chegga; 1 ♂, Nça-ben-Rzig; 1 ♂, Bled-el-Ahmar.

This species is not usually found in the true desert country, and is perhaps only a straggler south of Touggourt.

The range of *E. belemia* is much more restricted than that of *ausonia* (= *belia* auct. nec Linn.); it is recorded from the Canary Islands, South Spain, North Africa, Asia Minor and Syria, and hitherto only four subspecies have been separated: *belemia belemia* South Spain, *b. distincta* North Algeria and Tunis, *b. desertorum* South Algeria and Tunis, and *b. palaestinensis* from Asia Minor and Syria; the Canary Islands one I separate here as ***belemia hesperidum*** subsp. nov. on account of the very strong deep orange costa and the large amount of yellow on the underside of the apex of the forewing. Although the general run of specimens south of the Atlas do not show the marked obsolescence of marking and extra small size of typical examples of Count Turati's *E. b. desertorum* and its aberration *evanesceus* Röber, they are all not nearly so heavily marked as *b. distincta* from north of the Atlas. I therefore think that, though they approach nearer to true *belemia belemia* than the latter, they are distinct enough to be treated as a local race, and therefore retain the name *E. b. desertorum* for the present.

6. *Euchloë falloui* *obsolescens* subsp. nov.

1 ♂, Aïn Guettara ; 4 ♂♂, 2 ♀♀, north of Aïn Guettara ; 2 ♂♂, 1 ♀, South of Mya.

The distribution of *E. falloui* has been given as from Algeria south of the Atlas to Somaliland, and the ♀ has been described by Rüber as a separate species, *E. seitzi*.

When in Ghardaïa in April 1911 I was struck by some specimens taken by Dr. Nissen which showed on the underside a great deal of yellow, and the transverse green bands were more or less obliterated. I was going to describe this form as a new subspecies when I received a male somewhat similarly coloured among a batch of bred *falloui* from Victor Faroult. As he had mixed up the larvae bred from El-Outaya and Bou-Saada parents, I determined not to describe it till I could get authentic material. Meanwhile, in discussing matters with Dr. Nissen (the Danish Consul-General at Algiers), it suddenly struck me that this form with obsolescent bands might be the summer brood of *falloui*, just as *glauce* is of *belemia*. This has since been confirmed by the receipt by Dr. Nissen from Ghardaïa of specimens of *falloui* taken in March of this year, which are much more strongly banded below, and do not show any yellow. This, however, by no means ends the matter. Dr. Hartert obtained the above ten examples in a portion of the Sahara where no zoological collections have ever been made, and the males show even greater reduction of the bands than those from Ghardaïa. Although I was still convinced that we had only a case of second generation, Dr. Hartert was so insistent that there appeared to be other differences, that I have carefully compared Biskra specimens with Ghardaïa ones and the above ten specimens, and I have come to the conclusion that the form found at Ghardaïa and farther south is separable from those which fly on the edge of the desert and reach into the region of the "Hauts Plateaux."

This form, for which I propose the name of *falloui obsolescens*, differs from *f. falloui* in the spring generation in very few points ; in fact, I think the only real difference is that the green bands are more clearly separated, more definite in outline. The summer generation, however, is startlingly different ; in the more northern form the green bands are in the majority of individuals strongly tinged with yellow and rather more coalescent, the outlines being irregularly expanded after the manner of the summer generations of *ausonia* and *belemia* ; in the southern form these green stripes become almost obliterated, and of a gallstone-yellow colour. Although I have handled and examined more than a hundred specimens of the summer form from the north, I have only seen two specimens similar to Ghardaïa ones, and none as extreme as those from the Oued Mya, which are as pale below as extreme specimens of *P. d. albidice*.

Type, ♂. South Oued Mya, 10. iv. 1912.

[We took great pains to get a series of this form of *falloui*, but only succeeded in getting these ten specimens. They were very much rarer than *Pieris daplidice albidice*, though flying in the same places in the southernmost part. A single female was caught a kilometre south of the gorge of Aïn Guettara, in the morning at half-past five!

It is strange to me, in view of the well-known variability of *Pieridae*, how "*Euchloë seitzi*" could be described as a new species from two specimens, from the typical locality of *falloui*!—E. H.]



7. *Euchloë charlonia charlonia* (Donz.).

10 ♂♂, 1 ♀, Bordj Chégga; 2 ♂♂, Ourir; 1 ♂, Nça ben Rzig.

This species varies much in size; but there appear to be no separable subspecies till we get to Asia Minor and Syria, when we find *charlonia charlonia* replaced by *ch. penia* in Asia Minor, *ch. transcaspica* from Turan, *ch. lucilla* Butl. from West Himalayas, and two undescribed Indian forms.

A specimen, evidently wind-blown, was taken by Captain Holl in Hussein Dey, a suburb of Algiers town.

[In 1909, in March and April, when riding twice through the same countries, we never saw a sign of this species, while in 1912, late in February, it was quite common near Bordj Chégga, and extended as far south as Tamerna in diminishing numbers.—E. H.]

8. *Teracolus दौरا nouna* Luc.

13 ♂♂, 4 ♀♀, Ghardaïa.

This beautiful little butterfly is found in the northern portion of the Sahara wherever its food plants *Capparis droserifolia* and *spinosa* occur; it appears to reach farther north in Western Algeria, as Miss Fountain records it from Sebdeu. Lucas described it from the Algerian spring generation, which corresponds to the wet season form of the tropical *T. दौरا दौरا*. This led Röber to consider it as the winter form of *d. दौरا*, which, however, it certainly is not, as the two summer forms are abundantly distinct. This confusion of the two winter broods by Röber has led, unfortunately, to the western form being renamed *biscraensis*, and thus becoming burdened with a useless synonym. *T. दौरا दौरا* is abundant in the Egyptian Soudan and Abyssinia, but whether Arabian and Somali specimens are different still remains to be settled. *T. दौरا nouna* is confined to North-west Africa, and the summer generation is not very different from the spring brood.

[*T. दौरا nouna* was only seen at Ghardaïa. There it was quite common during the last days of May, but the majority of specimens were already in very bad condition. Once a great number were seen in the early morning sitting on a large plant of *Capparis spinosa*, while later in the day, when the sun was out, they were very restless. In 1911, in April, Mr. Rothschild and Dr. Nissen caught three specimens, in poor condition, and those were all that were seen.—E. H.]

9. *Colias electo croceus* Fourer.

1 ♀, Bordj Chégga; 2 ♂♂, Touggourt; 1 ♂, South Oued Mya.

Our well-known Clouded Yellow has an enormous breeding range if we take in *C. electo* as a whole—viz., from the Canary Islands on the west to Somaliland and Persia on the east and from Europe south of the Alps and Pyrenees in the north to Capetown in the south. The Palaearctic form *croceus* Fourer. = *edusa* Fabr. is confined to the countries north of the south boundary of the Sahara, and although it goes north to Great Britain and North Germany, it is only as a wanderer, for it is not found as a resident species north of the Alps. *C. electo electo* Linn. occurs all over Africa south of the Sahara and on the Canary Islands; it is said to have been taken in England, but the record appears doubtful.

[Common south of Biskra, but only a few were seen in the bed of the Oued Mya.—E. H.]

## DANAINAE.

10. *Danais chrysippus chrysippus* Linn.

1 ♂, South Oued Mya ; 1 ♀, north of Aïn Guettara ; 1 ♂, Igosten, Tidikelt.

This species occurs in two distinct forms throughout the larger portion of its range, which again have two subdivisions. The one, *D. c. chrysippus*, form. dimorph. *chrysippus* Linn., has the apical two-fifths of forewing black with a white band and white spots, and among these occur specimens with white or whitish discs of the hindwings = ab. *alcippus* Fabr. ; the second form is form. dimorph. *dorippus* Klug., which has the apical two-fifths brownish fulvous yellow like the rest of the wing, and again among these specimens with white or whitish discs to the hindwings occur : they are ab. *albinus* Lanz. *D. chrysippus* ranges from the Canary Islands and Morocco to South Japan in the north and from Cape Colony to Australia in the south ; east of Aden the dark ab. loc. *cratippus* Feld. is found among the typical form more or less abundantly.

This is the first record of the species for Algerian territory (it can hardly be called Algeria).

[The above-mentioned specimens were all that we saw, except one more in the bed of the Oued Mya, on May 2, which we could not catch.—E. H.]

## NYMPHALINAE.

11. *Pyrameis cardui cardui* (Linn.).

1 ♀, Bordj Chegga ; 1 ♀, north of Aïn Guettara.

This ubiquitous species inhabits the whole world with the exception of South America. It is subject to little variation, and in spite of the enormous extent of its range can only be split up into three subspecies : *P. c. cardui*, whole range except Arctic Regions and East Asia ; *P. c. pallida* Schoyen, with pale yellowish red ground colour, Arctic Regions ; and *P. c. japonica* Stichel, which is distinguished by the absence or reduction in the round submarginal spots of the hindwings and reddish ochre ground colour, East China and Japan.

[Common in the northern portion of the Sahara in February, and now and then seen as far south as Aïn Guettara.—E. H.]

[*Pyrameis atalanta* (L.) was seen in Biskra several times in March 1911, and this year I observed one on the road close to the market-place in Touggourt, on March 1st.—E. H.]

12. *Melitaea didyma deserticola* Oberth.

25 ♂♂, 5 ♀♀, Bordj Chegga to Kef-el-Dor.

*Melitaea didyma* is the most variable nymphaline butterfly in the world. It ranges from Portugal on the west to the Pacific Ocean on the east, and from North Europe and Siberia in the north to the Central Sahara in the south. (It probably extends right across the Sahara.)

Up to the present expedition this race of *didyma* was the most distinct from the type, being palest in colour, and had the greatest reduction in the size and number of the dark markings. One ♂ in the present series has the ground colour rufous yellow, thus appearing much paler than the rest ; the type came from Biskra.

The North Algerian and Tunisian form has been treated by Oberthür and others as the ordinary *didyma occidentalis*, but it is abundantly distinct. I here propose for this form the name **M. didyma nisseni** subsp. nov.; it differs from its nearest ally *M. didyma occidentalis* by its paler ground colour, larger number of black discal spots, and the heavy, sharply defined black margins to the hindwings.

Type ♂, No. 1001, Aïn Draham, Tunisia, July 1911, Victor Faroult. The form found in the Aurès Mountains and probably all over the " Hauts Plateaux " is much larger, being equal in size to *M. d. deserticola*; it has the darker red colour of *d. nisseni* and *d. occidentalis*, but has much fewer spots, thus approaching *d. deserticola*. I propose the name of **M. didyma interposita** subsp. nov. for it. Type ♂, No. 190, Batna 1911, Nelva coll. This form has also a very different underside, both the fulvous bands and the black spots being much reduced in size and much more ill-defined.

[Only seen as far south as Kef-el-Dor, and not farther north than Chegga, though Mr. Rothschild and I have caught this form near Biskra, and farther north in former years. In 1909 not a single specimen was seen south of Biskra, though they were quite common 65 kilometres south in one place on the road this year.—E. H.]

### 13. *Melitaea didyma harterti* subsp. nov.

5 ♂♂, 3 ♀♀, north of El-Golea; 4 ♂♂, South Oued Mya; 38 ♂♂, 21 ♀♀, El-Hadadra; 8 ♂♂, 2 ♀♀, Ghardaïa; 1 ♀, 26 kilometres east of Ghardaïa; 1 ♀, Oued Segrir, Guerrara; 1 ♂, Oued Nça; 1 ♀, sands of El-Arich.

This large series of 55 specimens varies a great deal in the number and size of the discal black spots, but the essential characters which separate this form from *d. deserticola* are present in all of them.

Differs above from *d. deserticola* by its much paler sandy ochre colour and much reduced black marginal bands; and the almost entire absence of the subapical yellow spots is also a distinguishing character. The ♀♀ in most cases have the black spots much reduced both in size and number. The Oued Nça specimen is the only one in which the ground colour approaches that of *d. deserticola*. Below in the ♂♂ the black spots on the hindwings are smaller and the fulvous bands broader and better defined. In colour this new form is intermediate between *M. d. deserticola* and *M. acraeina* from Central Asia.

The discovery of this form extends the range of *M. didyma* about 1000 kilometres to the south.

[This pretty butterfly was rare in the Oued Mya in May, but quite common in some places between Ghardaïa and El-Golea. It was mostly flying along the oueds, and rarely seen on the plateaus. It came very much to the flowers of *Deverra scoparia* and other flowers.—E. H.]

## LYCAENIDAE.

### 14. *Tarucus teophrastus teophrastus* (F.).

8 ♂♂, 1 ♀, Ghardaïa; 18 ♂♂, El-Hadadra; 2 ♂♂, North of Aïn Guettara; 9 ♂♂, 1 ♀, South Oued Mya; 1 ♂, 2 ♀♀, Oued Nça.

The Oued Mya examples, with the exception of one specimen, and one of the two from north of Aïn Guettara, are very much smaller; as the following measurements show.

Length of forewing: Ghardaïa and El-Hadadra, largest ♂, 13 mm., smallest ♂ 11 mm.; South Oued Mya, largest ♂, 11 mm., smallest ♂, 9 mm. If it should be found, at some future time, that the largest Oued Mya example is an accident, the South Saharan form will have to be separated. In 1908 and 1909 we found this species numerous round Biskra, and in 1911 equally so at Ghardaïa, but it never was found anywhere except in the immediate neighbourhood of the thorny Jujubiers, *Zizyphus lotus*.

[We found *T. teophrastus* common in the Oued Nça, and still more so near Ghardaïa and in the oases south of Ghardaïa, as far as *Zizyphus lotus* occurred. Together with *Zizyphus* this butterfly was absent from all the country traversed from Chegga to Touggourt and from Touggourt to El-Golea, also from El-Hadadra to El-Golea, and thence to the Oued Mya, where *Zizyphus* reappeared. They were always difficult to catch, as they kept closely to the bushes, which, on account of their thorns, were forbidding for our butterfly-nets.—E. H.]

#### 15. *Zizera lysimon lysimon* (Hbn.).

20 ♂♂, 5 ♀♀, Touggourt; 1 ♂, El-Golea; 2 ♂♂, South Oued Mya; 15 ♂♂, 1 ♀, Igosten, Tidikelt.

The Igosten specimens are on the average considerably smaller than the Touggourt ones, but here again at present I do not venture to separate them. In 1908 and 1909 we caught this little insect in Biskra and Touggourt, but we did not see it in 1911.

[Except for a few specimens in the Southern Oued Mya we never saw this Blue in other places than the gardens in the oases.—E. H.]

#### 16. *Lycaena astrarche cramera* Eschsch.

1 ♂, Sands of El-Arich.

*L. astrarche* is widely spread, reaching from the Canary Islands on the west to the Isle of Askold on the east, and Northern Scandinavia and Siberia in the north to the Central Sahara and North India in the south. The present race appears to be confined to the Canary Islands and North-West Africa.

#### 17. *Chrysophanus phlaeas phlaeas* (L.) ab. *eleus* F.

1 ♂, Ghardaïa.

This specimen is a good example of the tailed ab. *eleus*, but the bulk of the specimens of this widespread butterfly which have been taken in Algeria are ordinary *p. phlaeas*. It is found all over Algeria, though it is nowhere abundant.

### GRYPOCERA.

#### HESPERIIDAE.

#### 18. *Gegenes nostradamus* (F.).

1 ♂, Biskra.

The only specimen we ever caught of this genus during our four expeditions in Algeria.

[I only saw one other specimen on the road in Biskra.—E. H.]

## HETEROCERA.

## SPHINGIDAE.

19. *Macroglossum stellatarum* (Linn.).

1 ♂, South Oued Mya.

This widespread species is common all over Algeria, and we have specimens taken in previous years from almost every place we visited.

[We saw single specimens in various places from Biskra to the southernmost part of the Oued Mya.—E. H.]

20. *Celerio euphorbiae deserticola* (Bartels).

1 ♂, north of El-Golea.

The most northern locality I have specimens of this race from is El Kautara. When Dr. Jordan and I wrote our revision of the Sphingidae, the series in the Tring Museum consisted of a few dealers' specimens labelled "*Mauretania*." This led us to erroneously unite the desert form of *Celerio euphorbiae* with the more northern *C. e. mauretania*. This is not the case, as we discovered, since I have collected and procured in Algeria a large series of caught and bred specimens of the true *C. mauretania*. The most southern localities I have examples of the latter from are Khenchela and Batna, in the Aurès Mountains.

The larvae of *C. e. deserticola* are easily distinguished from those of *C. e. mauretania* by their pale green ground colour and sparser dark markings. They feed, as far as I have been able to ascertain, exclusively on *Euphorbia guyoniana*, while *C. e. mauretania* feeds on several species of *Euphorbia*. I have taken the larvae of *C. e. deserticola* at Biskra, Zaatcha, and along the road to Touggourt in large quantities, and caught the moth at light frequently at Biskra and once at Ghardaïa.

[The ♂ caught north of El-Golea, on May 21, was the only imago seen, but young and old larvae were found in the same district on *Euphorbia guyoniana*.—E. H.]

21. *Celerio lineata livornica* (Esp.).

1 ♂, Bordj Chegga ; 1 ♂, half-way between Ouargla and El-Golea ; 1 ♂, 6 ♀ ♀, north of El-Golea ; 1 ♀, El-Golea ; 1 ♀, South Oued Mya ; 3 ♂ ♂, 7 ♀ ♀, north of Aïn Guettara ; 6 ♂ ♂, 3 ♀ ♀, Aïn Guettara ; 1 ♂, In-Salah, Tidikelt ; 1 ♂, Oued Nça.

This is a widely spread race, being recorded from Portugal on the west to Japan on the east, and from Scotland in the north to Cape Colony in the south. *C. lineata* is found all over the world, and has three sharply defined subspecies : *C. lineata lineata*, confined to the Western Hemisphere ; *C. lineata livornica*, confined to Australia ; and *C. lineata livornica*, inhabiting the rest of the Eastern Hemisphere.

Whether the race under discussion is a permanent inhabitant of Central and Northern Asia and Japan I for the moment cannot accurately ascertain, but in Europe it is certainly only a migrant from Africa, and not always a regular one. The last great *livornica* year was 1906, when great numbers invaded Europe ; one collector in England captured eleven in two evenings, and Dr. Hartert and I found them in such masses at Luchon that they were quite a nuisance when working the lamps. On our preceding expeditions to Algeria we have caught them at Alger, Biskra, Ghardaïa, Guelts-Stel, and Khenchela,

Dr. Hartert found young larvae of this insect in great numbers in the Oued Mya, feeding on *Asphodelus tenuifolius*.

[In the southern Oued Mya, north of Ain Guettara, on April 11 many hundreds were seen flying and visiting the numerous flowers in full sunshine, while in the other places they were caught at light in the evening.—E. H.]

#### LYMANTRIDAE.

##### 22. *Ocneria uniformis* sp. nov.

1 ♀, South Oued Mya; 1 ♀, Ain Guettara.

♀. Palpi orange yellow; antennae shaft crimson buff; pectinations brown-black; head, thorax and abdomen cinnamon buff.—Forewing cinnamon buff, a slight rusty spot on lower discocellular.—Hindwing cinnamon.

Length of forewing: 18—20 mm.

This is allied to *O. rubea*, but the forewings are longer and more produced, and, beyond the slight rusty scaling at end of cell, are entirely devoid of marking.

##### 23. *Lymantria oberthuri* Luc.

1 ♂, Oued Saadana, south of Ghardaïa.

I have only seen one other specimen of this rare and beautiful species, also a ♂, which I took in 1909 at Bordj Ferdjan, between El-Oued and Touggourt. The types were caught in Tunisia.

##### 24. *Albarracina warionis warionis* (Oberth.).

4 ♀ ♀, Oued Nça.

This very rare species has had a variety of vicissitudes as regards its nomenclature. Oberthür in 1881 described it in the sixth part of his "Etudes" under the name of *Bombyx warionis*, saying he could not define its position till the ♂ was discovered. His type was captured in 1867 in the province of Oran. In 1883 the late Dr. Staudinger described two specimens, ♂ ♀, caught by Max Korb at Albarracina in Spain in August, as *Albarracina korbi* (*Ent. Zeit. Stettin*, pp. 179–80). In their *Catalog der Lepidopteren des Palaearctischen Faunengebietes* Drs. Staudinger and Rebel place Oberthür's *Bombyx warionis* in the *Notodontidae* under the genus *Pygæra*, and in brackets "(hujus generis?)" There matters remained till 1906, when Herr Bang-Haas described a ♀ from Tunis in *Iris* xix. as differing by the partial absence of the discal band from *Albarracina korbi*. In the *Entomologische Zeitschrift Stuttgart*, xxiii. p. 142 (No. 32), November 6, 1909, I named this North African form as subspecies *banghaasi*, having in 1909 captured a ♂ at Bordj Ferjan on the way to El-Oued, in the Oued Souf, South Algeria. Finally, Dr. E. Strand, December 22, 1910, in *Seitz' Macrolepidoptera of the World*, named this same form var. *deundulata*. I therefore think it will help to clear up the confusion if I here give a synopsis of the whole genus.

#### ALBARRACINA Stand.

##### 1. *warionis* Oberth.

*Bombyx warionis* Oberth., *Etud.* vi. p. 230. 17 f. 4 (1881).

*Albarracina korbi banghaasi* Rothsch., *Ent. Zeit. Stuttg.* xxiii. No. 32. p. 142 (1909).

*Albarracina korbi* var. *deundulata* Staud., *Seitz' Grosssch. d. Erde*, vol. ii. Palaearct. p. 133 (1910)

(MAURETANIA.)

1*a.* **warionis korbi** Staud.

*Albarracina korbi* Staud., *Ent. Zeit. Stett.* pp. 179-80 (1883). (SPAIN.)

1*b.* **warionis syriaca** Standf.

*Albarracina korbi* var. *syriaca* Standf., *Iris*, ii. p. 266 (1889). (SYRIA.)

2. **baui** Standf.

*Albarracina baui* Standf., *Iris*, ii. pp. 266, 267 (1889). (SYRIA.)

In two of Dr. Hartert's ♀♀ as well as in my own ♂ the discal band is entirely absent, but in the two other ♀♀ it is plainly present, only in its apical part it is almost obsolete, while the posterior half is less developed than in *warionis korbi*.

The genus *Albarracina* is now placed by lepidopterists at the end of the *Lymantriidae*.

**LASIOCAMPIDAE.**25. **Chilena hilgerti** sp. nov.

2 ♀♀, Oued-el-Abiod, north of In-Salah.

This new species is allied closely to *pura* Warr., and its position is next to *obliquata* Klug.

♀. Palpi and head pale cream-buff; antennae sandy yellow; thorax and abdomen greyish cream-white. Forewing cream-colour, with a cinnamon shade becoming paler on terminal third of wing, nervures darker, a pale greyish shadow line from apex to inner margin one-fourth from torus, a raised white median stigma. Hindwing greyish cream-white, nervures yellowish.

Length of forewing: 24—29 mm.

Type: No. 957, 13. 4. 1912. This is nearest to *obliquata* Klug., but differs in the total absence of the rusty markings on hindwings and abdomen.

In connection with this species I should like to remark that in several copies on Pl. I. of his *Etudes*, Liv. vi., Mr. Oberthür gives a figure of what appears to be a **large white Lasiocampid** moth, and says in the text it is a figure of his *Bombyx luteus*, which he describes as a **small species of a uniform golden yellow** all over. This is a direct proof of what I said at Oxford, at the Entomological Congress, that however desirable figures were, an accurate description was of greater importance, for any author was liable to be betrayed by the inaccuracy of his artist or colourist: *lutea* ♂♀ is again figured in *Etudes*, Liv. xii.

[On April 13th we camped in the bed of the Oued-el-Abiod—a river-bed with much "driu" and a few bushes of *Zizyphus lotus*, surrounded by sand blown on to a rocky plain. There we caught one specimen. On our return journey we camped there again on the 25th in exactly the same spot, and we then got the second one. No other specimens were seen, but the night of the 13th was very windy, and the 25th yielded altogether only a few specimens. I am glad to see this species named after my companion.—E. H.]

**NOCTUIDAE.****AGROTINAE.**26. **Chloridia nubigera** (Herr.-Sch.).

1 ♂, north of Ain Guettara; 1 ♀, Oued Nça.

I have two of this rather dowdy-looking species from Victor Faroult from Khenchela, and Dr. Jordan and I took it there this year. Dr. Nissen got one this year at Guelt-es-Stel.

27. *Timora striata* Stdgr.

1 ♂, half-way between Ouargla and El-Golea; 1 ♀, north of El-Golea.  
We first collected this beautiful species on the way to El-Oued at Bordj Ferjan in 1909.

28. *Euxoa hodnae* (Oberth.).

2 ♂♂, 2 ♀♀, Bordj Chegga.

Was described from the centre of the "Hauts Plateaux," but appears to occur all along the edge of the desert as well. Rather rare everywhere.

29. *Euxoa spinifera* Hübn.

1 ♀, Bordj Saada; 1 ♀, South Oued Mya.

A widespread Palaearctic noctuid.

30. *Euxoa radius* (Haw.).

1 ♀, Bordj Chegga; 1 ♂, 1 ♀, Kef-el-Dor.

A most variable insect in size, colour, and marking. I have a large series of it from Victor Faroult from Bou Saada. We ourselves have taken it at Biskra, and a few elsewhere.

31. *Euxoa mauretanica* (Bang-Haas).

1 ♂, 2 ♀♀, Ghardaïa; 1 ♀, Oued Nça.

This is a most extraordinary moth, and no one at first sight would believe that two specimens of the opposite extremes could be the same species, hardly even the same genus; but the fine series of one hundred specimens sent from Bou Saada by Victor Faroult shows every intergradation from sooty plum violet with heavy markings to pale sandy yellow with practically no marking at all.

32. *Agrotis imperator* Bang-Haas.

1 ♂, north of El-Golea; 1 ♂, 1 ♀, Oued el-Far, south of Fort Miribel; 11 ♂♂, 8 ♀♀, South Oued Mya; 1 ♂, 1 ♀, Ain Guettara.

This magnificent species was only described and published this autumn (*Iris*, vol. xxvi. p. 142, 1912). I had no idea the insect was undescribed, as I had received it under this name from its author in 1910!!!

It was described from Biskra specimens, but I have never taken it there myself; though, besides the two **author's cotypes** mentioned above, I have three from Biskra, bought in 1911 from Faroult. I have, in 1911 and 1912, received many from the latter from Bou Saada, Tilrhempt, Khenchela, etc.

They differ somewhat in the width and degree of black colour of the two discal transverse lines, very few of the more southern specimens equalling in this respect the Biskra and Bou Saada ones.

This species is nearest to *Agrotis melanura* Koll.

**HADENINAE.**

33. *Discestra vacina* (Püng.).

2 ♂♂, Bordj Saada; 4 ♂♂, Bordj Chegga.

Originally described from Central Asia.



34. *Discestra arenaria* Hmps. n.

2 ♂♂, Bordj Chegga.

Described from Karachi, India. The wide distribution appears to be common to the greater number of desert species.

35. *Scotogramma cinnamomina* sp. nov.

1 ♀, Nza-ben-Rzig; 1 ♀, Mraïer, between Biskra and Touggourt; 1 ♂, 3 ♀♀, sands of El-Arich, S.W. of Touggourt.

♀. This has been mixed up, together with *treitschkei* Bois., with *S. trifolii* Rott., with which neither are conspecific.

It differs at first sight from *treitschkei* by its much longer and more acute wings and saudy cinnamon colour; the reniform is much larger, and the markings generally are more distinct but less deeply coloured; basal three-quarters of hindwing greyish white, **not** pale wood-brown.

♂. Similar. Type, ♀ Nza-ben-Rzig.

Length of forewing: ♀ 18—21 mm.; ♂ 19.5 mm.

” ” ” *treitschkei*, 16—18 mm.

36. *Polia cinnamomeogrisea* sp. nov.

18 ♂♂, 28 ♀♀ Bordj Chegga; 1 ♂ Kef-el-Dor.

♂. Head and thorax pale grey mixed with cinnamon and darker grey; abdomen brownish wood-grey.—Forewing silvery grey powdered with darker grey, irregular ante- and postmedian lines and various spots greenish grey, a broad, pale cinnamon band from base to tornus along median fold, a shorter similar one from inner stigma to central one of the three subterminal greenish grey spots.—Hindwing buffish grey mixed with pale cinnamon, an ill-defined broad subterminal sooty band.

Length of forewing: 21 mm.

Rather variable in shade of colour and distinctness of cinnamon bars.

37. *Odontelia griseola* sp. nov.

4 ♂♂, Mraïer, half-way between Biskra and Touggourt; 1 ♀ half-way between Ouargla and El-Golea.

♂. Antennae dark brown; head and thorax silvery grey, freckled sparingly with black, a black hairline across tegulae and patagia inside and back of thorax with black hairline edges; abdomen cinnamon brown-grey.—Forewing silvery grey powdered and marked with darker grey; stigma almost obsolete, on holly-leaf pattern of pale whitish grey edged with black below median vein almost to apex, nervures slightly marked with black.—Hindwing greyish white, powdered with dark grey.

♀. Larger, more ash-grey, and markings and colour of veins stronger.

One ♂ is strongly washed with rose; this I call ab. *rosacea* ab. nov.

Length of forewing, ♂ 26 mm., ♀ 30 mm.

At once distinguishable from the type of the genus *margiana* Püng. by its much longer and more pointed wings, pale hindwings, absence of stigma, and in the male filiform antennae, **not**, as in the type, strongly pectinated ones.

The type species *margiana*, described by Püngeler, came from Central Asia.

38. *Pronatestra silenides* (Stdgr.).

1 ♂, Kef-el-Dor.

I have taken this insect at light in numbers at Tirlhempt and Ghardaïa in 1911, and at Gneft-es-Stel in 1912, and have received many from Victor Faroult from Bou Saada.

39. *Cardepia sociabilis* Grasl.

1 ♂, Bordj Chegga.

Both *irrisor* Ersch. and *inguinata* Mab. are distinct species, the latter even belongs to another genus.

40. *Cardepia affinis* sp. nov.

1 ♂, Kef-el-Dor.

♂. Allied to *sociabilis*. Differs in the almost pure satiny white hindwings, in the position of the inner stigma and spot below it, and in the presence of the strong, cloudy, zigzag, transverse, ante-terminal brown band.

40A. *Cirphis loreyi* (Dupon).

1 ♀, El-Golea.

A common widespread species.

41. *Copicucullia cyrtana cyrtana* (Mab.).

13 ♂♂, 1 ♀, Bordj Saada; 17 ♂♂, 4 ♀♀, Bordj Chegga; 4 ♂♂, Kef-el-Dor; 3 ♂♂, 2 ♀♀, Nza-ben-Rzig; 1 ♀, Mraïer, 1 ♂, Arefidji, north of Ouargla.

This is a rather variable species as regards colour of hindwing and depth of marking, some of the more heavily marked specimens almost equalling the race described below. In addition to this series, in previous years we have collected and received through Victor Faroult specimens from El-Kantara, Biskra, Ghardaïa, Bou Saada, Colomb Bechar, Aïn Draham, Khenchela, etc.

The specimens from the Canary Islands are much more heavily marked than those from N.W. Africa, and I propose to call this subspecies *Cucullia cyrtana hesperidum* subsp. nov.

42. *Cucullia lucifuga* Hübn.

1 ♂, 1 ♀, Bordj Chegga.

These are not quite typical, resembling at first sight more the ♀♀ of *C. umbratica* and *chamomillae*; but unless one has had the larva as well as the imago for comparison it is impossible to safely split up any *Cucullia* into subspecies.

43. *Copiphana gassana* (Blachier).

1 ♂, Mraïer, between Biskra and Touggourt; 1 ♂, halfway between Touggourt and Ouargla; 1 ♀, Hassi el-Hadjar, S.W. of Ouargla; 1 ♀, north of El-Golea.

This species appeared to be very rare this year. In 1911 we caught it in large numbers at Ghardaïa and Tirlhempt; but also at Tirlhempt this year Victor Faroult only caught very few.

Like most of the other species formerly united in *Cleophana* as well as the species of *Calophasia*, *C. gassana* varies much in depth of colour, and specimens of uniform cream-white with few or no markings above are not very rare. This white form has been described as a distinct species by Bang-Haas, under the name of *Cleophana albina*.

44. *Cleophana chabordis* Oberth.

1 ♂, 1 ♀, sands of El-Arich, S.W. of Touggourt; 1 ♀, 1 ♂, half-way between Touggourt and Onargla; 1 ♂, Arefidji, north of Ouargla; 1 ♀, Hassi el-Hadjjar, S.W. of Onargla; 6 ♂♂, 3 ♀♀, half-way between Onargla and El-Golea; 1 ♂, 1 ♀, north of El-Golea; 1 ♂, 4 ♀♀, South Oued Mya; 1 ♂, 1 ♀, El-Hadadra; 2 ♀♀, Saadana, south of Ghardaïa; 1 ♂, 1 ♀, Oned Abiod, south of Ghardaïa; 1 ♂, 2 ♀♀, Oued Nça.

This is the most abundant of the *Cleophana* group. It varies from dark greenish grey with greenish copper bands and white marks to pure white with coppery yellow bands; the latter are the ab. *albicans* Stdgr. I have it from all the places we collected in south of the Atlas, and in quantities from most southern localities visited by Victor Faroult.

45. *Harpagophana picturata* (Rothsch.).

1 ♀, Arefidji, south of Ouargla.

Of this species as yet only three specimens exist: the type, caught by myself in 1909 at Mraier, between Biskra and Touggourt; a very poor specimen received from South Tunisia, by Bang-Haas; and the present one. Sir George Hampson places this and *hilaris* Staudgr. in the genus *Harpagophana*; but *hilaris*, which was described as a *Metopoceras*, hardly seems to me congeneric with this small delicate species.

46. *Metopoceras omar* (Oberth.).

2 ♂♂, Bordj Chegga; 1 ♂, Bordj Saada; 1 ♂, Kef-el-Dor.

In former years we have caught many of this species at Ghardaïa and Tilrhempt, and I have received it in quantity from Bou Saada from Victor Faroult. It varies in tinge from dark grey to pale ash-grey, and some of the more northern specimens exhibit a distinct rufous tinge. I have also taken it at Guelt-es-Stel, Khenchela, and Hammam Meskoutine.

As the number of species is very large and the identification difficult, I fear the article on Dr. Jordan's and my collections in Guelt-es-Stel may not be ready for some time, so I here describe two new forms we got there, and one from Khenchela:

*Metopoceras canteneri pallidior* subsp. nov.

♂. Differs from Spanish and Portuguese *M. c. canteneri* in being much paler; the ground colour is greyish yellowish liver-brown, not deep rufous, the markings are not so sharply defined, and the white subternal dot is absent; the terminal dark band on hindwing is paler and less distinct.

♀ similar.

2 ♂♂, Guelt-es-Stel, Central Algeria, April 19, 1912 (W. Rothschild and K. Jordan); 1 ♂, 1 ♀, Bou Saada, Algeria, May 1911 (Victor Faroult).

*Ammetopa nisseni* sp. nov.

♂. Antennae brown; head and thorax greyish liver-brown tinged with yellow; abdomen pale wood-grey.—Forewing greyish liver-brown; antemedian, median, and postmedian zigzag waved transverse lines sooty black, somewhat indistinct, the outer one strongly bowed out and angled.—Hindwing greyish wood-brown with darker indistinct subterminal band.

One of the three specimens is much paler, the ground colour being cinnamon.

Length of forewing: 15 mm.

4 ♂♂, Guellet-es-Stel, Central Algeria, April 18, 1912 (W. Rothschild and K. Jordan).

In the type specimen the median transverse line is obsolescent and broken, but in the other three it is distinct.

#### ***Omphalophana serrata pallidior* subsp. nov.**

Differs from *serrata serrata* from Portugal and Spain in its much paler colour. The basal third of forewing and thorax are greyish white, **not** dark mouse-grey, and the outer third of forewing is pale ash-grey with long white streaks, **not** dark mouse-grey with short white streaks. Tunisian specimens are also of this pale form.

A small series from Khenchela, E. Central Algeria (Aurès Mountains), May 1912 (W. Rothschild and K. Jordan); 1 ♂, 2 ♀♀, Djerba and Ain Draham, Tunisia (Dannehl and Victor Faroult).

N. Spanish specimens of this species appear to be browner than Portuguese ones, but I have too few to justify my separating them at present.

Type of *serrata pallidior*, No. 1075, Khenchela, May 10, 1912. This race occupies the same relationship to *O. serrata serrata* as my *Cleophana baetica diluta* does to *C. baetica baetica*.

#### **47. *Criophasia albolineata* (Blachier).**

11 ♂♂, 9 ♀♀, Bordj Chegga; 2 ♂♂, 2 ♀♀, Kef-el-Dor; 1 ♂, 1 ♀, north of Ouargla.

I first took this pretty species at light in Biskra in 1908, and have taken it in small numbers each succeeding year at Biskra, Kef-el-Dor, and other localities. I have also received three or four from Biskra, Bou Saada, and El-Kantara, from Victor Faroult. It does not appear to be abundant anywhere.

#### **48. *Calophasia kraussi* Rebel.**

3 ♂♂, 1 ♀, half-way between Tougourt and Ouargla; 3 ♀♀, Arefidji, north of Ouargla; 5 ♂♂, 5 ♀♀, Hassi el-Hadjar; 44 ♂♂, 18 ♀♀, half-way between Ouargla and El-Golea; 2 ♂♂, 2 ♀♀, north of El-Golea; 2 ♀♀, South Oued Mya.

Like all the *Cleophana-Calophasia* group of the *Cucullianae*, this is an extremely variable insect as regards colour. The typical form has head and thorax lavender blue-grey, abdomen brownish cream-grey; forewings lavender blue-grey, nervures black-brown, a broad white band along median fold and an elbowed one from base of vein 5 to apex of wing, a narrow line along and below median white band and a broad smear along apico-cellular one black-brown, fringe chequered brown, grey, and white; hindwings, basal half greyish white, outer half dark mouse-grey.

A second form has the thorax buffish brown, the forewings marked as in the above but saturated with yellowish brown, and hindwings yellowish wood-grey. This I propose to call ab. *brunnea*, ab. nov.

The most extreme colour phase has the head and thorax white, the abdomen pale yellowish grey; the forewings white with the faintest possible grey tinge, and

the dark smear and line along the wings, where normally the white bands are placed, are buffy yellow; the hindwings pale greyish buff; fringes of all wings pure white. This I propose to call ab. *albo-ochracea* ab. nov.

All intermediates occur.

We have taken this insect in 1911 at Tilghempt and Ghardaïa, and I have received a few specimens from Bou Saada, from Victor Faroult. Hitherto it has been extremely rare in collections, and there is only a single specimen in the British Museum, from Fontaine Chaude, Biskra.

#### 49. *Calophasia stigmatica* sp. nov.

1 ♀, half-way between Ouargla and El-Golea; 1 ♂, South Oned Mya.

♂. Bluish ash-grey.—Forewing with paler streak below cell on median fold, reniform stigma sharply defined, whitish ringed sooty grey, an oblique sooty band from vein 5 near termen to vein 2, two-thirds from origin.—Hindwing whitish grey with wide sooty terminal band.

♀ has distinct band from reniform to middle of inner margin, a black hair-line along vein 1 and termen to apex, and a less clear terminal band on hindwing.

Length of forewing: 14 mm.

### ACRONYCTINAE.

#### 50. *Pseudohadena chenopodiphaga* (Rambr.).

1 ♂, north of El-Golea.

Described from south of France.

#### 51. *Bryophila incerta* sp. nov.

1 ♂, 1 ♀, Oned Nça.

♂ ♀. Sooty brown, an interrupted black-brown band of patches across forewing at reniform stigma and a series of indistinct wavy hairlines all over forewing, a dark patch before apex.

Length of forewing: 12 mm.

#### 52. *Bryophila pineti* Standgr.

27 ♂♂, 21 ♀♀, Oned Nça.

The species was originally described from Spain. It is shown by this fine series to be extremely variable. The phase originally described has bluish mouse-grey forewings and the markings very faint. Another phase has the central two-thirds of forewing **longitudinally** pale cinnamon; this I will name ab. *rapitincta* ab. nov. A third form has the forewings more ash-grey with an oblique dusky band from apex to inner margin, one-fourth from termen, and the basal three-fourths of wing below median fold black; this I name ab. *distincta* ab. nov. A fourth form resembles the last, but has all markings much darker and more distinct and the whole wing suffused with black-brown; for this I propose the name ab. *saturation* ab. nov.

#### 53. *Prodenia litura* (Fabr.).

1 ♂, Biskra.

This is a very widespread species.

54. *Laphigma exigua junceti* (Zell.).

1 ♀, halfway between Onargla and El-Golea; 1 ♂, north of El-Golea, 7 ♂♂, 10 ♀♀, South Oued Mya; 1 ♀, north of Aïn Guettara; 2 ♀♀, Aïn Guettara; 1 ♀, Igosten, Tidikelt; 1 ♂, 1 ♀, In-Salah, Tidikelt.

This is an enormously widespread species, reaching from Europe to Hawaii and New South Wales. *Laphigma exigua exigua* Hübn. occurs in Europe with the exception of the Iberian peninsula, and probably Italy and Sicily; *L. exigua junceti* occurs in the Iberian Peninsula, Mauretania, and probably Italy and Sicily; *L. exigua venosa* Butl. occurs in the Hawaiian Islands, and *L. exigua caradrinoides* Walk. occurs all over Africa south of the Sahara; the specimens from New South Wales are larger, greyer, and very strongly marked; I name this race *L. exigua prominens* subsp. nov. Other local races will no doubt be easily separable if large series from each locality are compared.

55. *Rabinopteryx subtilis* (Mab.).

1 ♀, Bordj Saada; 3 ♂♂, 8 ♀♀, Bordj Chegga; 1 ♀, halfway between Touggourt and Onargla.

I have taken this at Biskra in 1908, 1909, and 1911, and also on the way to Touggourt in 1909.

56. *Athetis flava* (Oberth.).

1 ♂, ♀♀, South Oued Mya; 3 ♀♀, north of Aïn Guettara; 1 ♀, Aïn Guettara.

This is a widespread desert species. I first saw it among José Steinbach's captures in Biskra in 1908. I took a few in 1909 at and near Biskra, and we got it at Ghardaïa in 1911. Victor Faroult has sent many from Bou Saada and El-Kautara. This year Dr. Jordan and I took a number at Guelt-es-Stel.

57. *Athetis oberthuri* sp. nov.

1 ♂, 3 ♀♀, South Oued Mya.

Allied to *flava* Oberth., but much smaller, with shorter rounder wings and pure white hindwings.

♂. Differs from *flava* in having a row of black spots along costa, two black spots on median fold, and a more strongly marked reniform stigma, a row of terminal black dots.—Hindwings semihyaline pure white with rosy fringe, **not** grey as in *flava*.

Length of forewing: *oberthuri* 15 mm.; *flava* 19 mm.

58. *Athetis clavipalpis* (Scop.).

1 ♂, South Oued Mya.

A very widespread species.

**ERASTRIANAE.**59. *Eublemma mozabitica* Rothsch.

1 ♀, halfway between Onargla and El-Golea; 1 ♀, South Oued Mya.

I described this species from three ♀♀, collected by Dr. Hartert and myself

at Ghardaïa in 1911, *Nov. Zoolog.* xix. p. 126 (1912). I have received a few since from Victor Faroult, from Bou Saada, and Tihrempt, but it appears to be a rare insect.

60. **Eublemma albida** (Dupon).

1 ♀, South Oued Mya ; 1 ♂, Saadana, south of Ghardaïa.

This species is closely allied to *mozabitica*, but appears to be distinct enough.

61. **Eublemma griseola** (Ersch.).

1 ♀, El-Meksa, south of El-Golea ; 1 ♀, south of El-Golea ; 1 ♀, South Oued Mya.

Was described from Armenia and Turkestan.

62. **Eublemma deserta** (Stand.).

1 ♂, north of El-Golea ; 1 ♂, 1 ♀, South Oued Mya ; 1 ♂, north of Aïn Guettara ; 1 ♂, Aïn Guettara ; 1 ♂, Oued Abiod, north of In-Salah ; 1 Oued Nça.

This species was described from Biskra, but we have never taken it before.

63. **Eublemma vestalis** (Stand.).

1 ♂, South Oued Mya ; 1 ♀, Oued Abiod, south of Ghardaïa.

Standinger's type came from Palestine.

64. **Eublemma sabulosa** sp. nov.

1 ♀, South Oued Mya.

♀. Allied to *gayneri* (Rothsch. and Warr.). Head, thorax and abdomen sandy yellow.—Forewing sandy yellow with some darker clouding ; an indistinct rusty antemedian and a broad distinct rusty brown postmedian band, the latter only reaching subcostal vein, an anteterminal bluish grey-brown transverse band and a terminal row of dots.—Hindwing, satiny cream-white.

Length of forewing : 14 mm.

65. **Eublemma arida** sp. nov.

1 ♂, 1 ♀, south of El-Golea.

♂. Head and tegulae white, rest of thorax pale grey ; abdomen greyish buff.—Forewing brown-buff.—Hindwing creamy buff. The termen of forewing very straight and sharply cut, not rounded as in most *Eublemmas*.

♀ similar, but wider and terminal margin darker.

Length of forewing : ♂ 11 mm. ; ♀ 10 mm.

66. **Eulocastra diaphora atribasalis** Hmps.

1 ♂, 1 ♀, South Oued Mya.

This is again one of the widely spread species of desert lepidoptera. Sir George Hampson has treated the various named races as aberrations, but there are four good local subspecies : *E. diaphora diaphora* Staud. from Northern Asia Minor and Armenia ; *E. diaphora atribasalis* Hmps., Arabia and North-West Africa

*E. diaphora laticincta* Staud., Mardin, Persia, Syria, Palestine ; *E. diaphora triangularis* Warr., India.

*E. d. atribasalis* is smaller and whiter than the type ; *d. laticincta* has much wider black margins and more dusky hindwings ; *d. triangularis* has forewing strongly washed with rufous. A specimen sent by Victor Faroult from Colomb Bechar has forewings sandy yellow.

#### 67. *Tarache bisraensis* (Oberth.).

1 ♂, 1 ♀, Hassi el-Hadjar, S.W. of Ouargla ; 1 ♀, half-way between Ouargla and El-Golea ; 3 ♀ ♀, north of El-Golea ; 1 ♀, South Oued Mya.

This species was described from Biskra, but I never took it there. I have taken it in 1911 at Ghardaia, and received a few from Victor Faroult from Bou Saada.

### CATOCALINAE.

#### 68. *Clytie terrulenta* Christ.

2 ♂♂, 6 ♀♀, South Oued Mya.

This species was described from Armenia and Western Turkestan, proving again the wide range of the desert insects.

#### 69. *Clytie arenosa* sp. nov.

2 ♂♂, 6 ♀♀, South Oued Mya.

♂. Sandy cinnamon.—Forewing powdered with grey scales, a figure of 8 stigma, ante- and postmedian lines faintly indicated, an ante-terminal transverse zigzag black band and a terminal line of hairline lunules.—Hindwing has a broad discal black band and a terminal row of coalescent dark lunules.

♀ has on forewing the ante- and postmedian lines strongly marked sooty black and the ante-terminal line obsolete. On hindwing the discal band is less intense black.

Length of forewing : ♂ 19 mm., ♀ 19-23 mm.

#### 70. *Leucanitis kabyllaria* Bang-Haas.

1 ♀ half-way between Ouargla and El-Golea.

This is a somewhat rare insect, and I have very few specimens from Algeria. We caught two or three in 1909 at Bordj Ferjan and one at Ghardaia in 1911, and I have two from Bou Saada from Victor Faroult.

#### 71. *Imitator straminea* (Bang-Haas).

2 ♂♂, 18 ♀♀, Nza-ben-Rzig ; 2 ♂♂, 8 ♀♀, Mraïer, between Biskra and Touggourt ; 1 ♂, Tamerna, north of Touggourt ; 1 ♂, 8 ♀♀, half-way between Touggourt and Ouargla ; 3 ♂♂, 10 ♀♀, Arefidji, north of Ouargla ; 2 ♂♂, 1 ♀, Hassi el-Hadjar, south-west of Ouargla ; 3 ♂♂, 2 ♀♀, half-way between Ouargla and El-Golea ; 4 ♂♂, 6 ♀♀, north of El-Golea.

This is a pure desert species ; it was placed by its describer in the genus *Palpangula*, but it is only a case of general resemblance, as it is not in any way closely related to the *Palpangula* group. We first came across it in 1909 between Touggourt and El-Oued, and then in 1911 at Tilrhempt. I have also received



large numbers from Victor Faroult from Bou-Saada, Tizrhempt, Colomb-Bechar, and elsewhere in Algeria.

This species is also variable in colour, ranging from pure creamy sand-colour to wood-brown, with or without black markings.

72. *Cortyta fasciolata* (Warr.).

1 ♀, South Oued Mya; 1 ♀, Ain Guettara.

This species was described from a series collected by my brother in Egypt. It is quite distinct from *Cortyta dispar* Püngl, which has the ante- and postmedian bands much wider apart.

73. *Pericyma rosacea* Rebel.

1 ♂, South Oued Mya.

The only other record of this species is the original description. The type came from Socotra. This is another example of the enormous range of the purely desert species. Its nearest ally is *P. profesta* Christ. from Transcaucasia, which however differs in its mouse-grey colour and less scalloped hindwings; *P. profesta sacra* Staud., from Palestine, approaches it most in having more strongly marked transverse bands.

74. *Plusia ni deserticola* Oberth.

1 ♀, El-Golea.

We have taken this insect at Biskra, and I have received it from Victor Faroult from several localities. We have taken it sparingly also at other places.

75. *Grammodes stolidia* (F.).

1 ♂, Ghardaïa; 2 ♂♂, 2 ♀♀, Oued Nça.

This is not at all abundant in Algeria—in fact, much less so than its near ally *boisdeffrei* Oberth., which, however, curious to say, I have never taken or received. We took two or three on the way to El-Oued in 1909, and I have one or two from Bou-Saada from Victor Faroult.

76. *Grammodes algira* (Linn.).

1 ♂, Biskra.

This is a widespread insect. I have only seen it singly in Algeria. It was, however, in fair numbers at Luchon in the Pyrenees in 1905, though very hard to catch.

77. *Anumeta henkei* (Stdgr.).

2 ♂♂, north of El-Golea; 1 ♀, south of El-Golea; 1 ♂, 1 ♀, Saadana, south of Ghardaïa.

Another widespread desert insect described from south-east Russia and Transcaucasia.

78. *Anumeta sabulosa* sp. nov.

1 ♂, South Oued Mya.

Allied closely to *henkei* Stdgr. but at once distinguishable by its sandy brown forewings and the much straighter and differently placed postmedian and sub-terminal bands. Head and thorax sandy cinnamon; abdomen pale sandy greyish

brown.—Forewing sandy cinnamon washed with pale sooty brown; antemedian line much less zigzag than in *henkei*; the line which is postmedian in *henkei* is here median, and is a convex line **not** waved and zigzag, the ante-terminal band is evenly waved and transverse, **not** sharply angled and oblique, the terminal row of spots is larger, and their connecting half-moon-shaped lines are more or less obsolete.

Length of forewing: 18 mm.

#### 79. *Anumeta major* sp. nov.

1 ♀, north of El-Golea.

♀. This is the largest Palaearctic species. Antennae dark brown; head and thorax chestnut wood-brown thinly powdered with black scales; abdomen greyish testaceous buff.—Forewing deep chocolate wood-brown variegated with rough grey hairy scales; two dark ill-defined patches near centre of costal area, and a similar dark band from base below median vein curving upwards along apex of cell and joining the outer costal patch, ante-terminal line oblique zigzag brownish-white, a large black apical spot, terminal row of spots without white dots.—Hindwing pale greyish wood-brown, abdominal margin and a large patch termen white, the latter with large black eye-spot, an ill-defined buffish median broad band.

Length of forewing: 25 mm.

#### 80. *Anumeta cestis* (Mén.).

1 ♀, half-way between Touggourt and Ouargla; 2 ♂♂, 3 ♀♀, Arefidji, north of Ouargla; 1 ♀, Hassi el-Hadjar, south-west of Ouargla; 3 ♂♂, 1 ♀, half-way between Ouargla and El-Golea; 3 ♀♀ north of El-Golea.

This is a very variable species, ranging on forewings from grey-brown heavily marked to uniform deep chocolate without markings. We took this in large numbers in 1909 between Touggourt and El-Oued.

#### 81. *Anumeta hilgerti* (Rothsch.).

1 ♀, half-way between Ouargla and Touggourt; 1 ♀, Arefidji, north of Ouargla; 1 ♀, Hassi el-Hadjar, south-west of Ouargla; 1 ♀, half-way between Ouargla and El-Golea; 3 ♂♂, north of El-Golea; 1 ♀, south of El-Golea; 1 ♂, 3 ♀♀, Oued Abiod, north of In-Salah.

This varies also very considerably in the colour and marking of the forewing. At first sight it might be confused with *Anumeta cestina* Stand., but the bands on the forewings are differently placed; it may be an *Imitator*.

#### 82. *Cerocala scapulosa algeriae* Oberth.

2 ♂♂, Bordj Chegga; 1 ♂, Nœa-ben-Rzig; 3 ♂♂, 7 ♀♀, half-way between Touggourt and Ouargla; 6 ♂♂, 4 ♀♀, Arefidji, North of Ouargla; 4 ♂♂, 6 ♀♀, Hassi el-Hadjar, south-west of Ouargla; 11 ♂♂, 8 ♀♀, half-way between Ouargla and El-Golea; 4 ♂♂, 11 ♀♀, north of El-Golea; 1 ♀, south of El-Golea.

This is a most variable insect in pattern, colour, and size.

We found it first at Biskra in 1909, and then took a few all along our route to El-Oued, but did not come across it in quantity till we got to Ghardaïa in 1911. I have received it also from various places from Victor Farault.

83. *Apopstes cataphanes roseata* (Rothsch.).

1 ♀, north of El-Golea; 1 ♂, Fort Miribel; 3 ♂♂, 8 ♀♀, South Oued Mya; 4 ♂♂, 8 ♀♀, north of Aïn Guettara; 1 ♀, Aïn Guettara; 1 ♀, In-Salah, Tidikelt.

I described this race as a new species in *Nov. Zool.* xix. p. 126 (1912). The type is one of our own catching at Ghardaïa in 1911. It is very close to the form described by Standinger as var. *maura*, but has heavier black marking and appears confined to more desert localities, as El-Kantara and Bou-Saada, its most northern localities, are on the edge of the desert, and it only becomes frequent much farther south.

84. *Apopstes dilucida rosea* (Stand.).

6 ♂♂, 1 ♀, north of Aïn Guettara; 7 ♂♂, 6 ♀♀, South Oued Mya; 1 ♀, south of El-Golea; 2 ♂♂, 7 ♀♀, Oued Nça.

This is one of the commonest Algerian noctuids both in the desert and on the "Hauts Plateaux," but does not go very far north.

## GEOMETRIDAE.

## GEOMETRINAE.

85. *Pingasa lahayei* (Oberth.).

1 ♀, South Oued Mya.

I took a ♂ of this rare species in 1909 at Biskra at light.

86. *Zuleika nobiliaria* Bang-Haas.

1 ♂, Hassi el-Hadjar; 1 ♀, half-way between Ouargla and El-Golea; 1 ♂ north of El-Golea; 1 ♂, Oued Nça.

## ACIDALIINAE.

87. *Acidalia remotata* Guén.

1 ♂, Ghardaïa.

88. *Acidalia flaccata* Stdgr.

1 ♂, 1 ♀, Bordj Saada, south of Biskra.

This species was described from Palestine, but is recorded from Biskra.

89. *Acidalia romanarioides* sp. nov.

6 ♂♂, 7 ♀♀, South Oued Mya; 2 ♀♀, north of Aïn Guettara; 2 ♂♂, 3 ♀♀ Aïn Guettara.

♂♀. Allied to *romanaria*, but very distinct; in size approaching *rufomixtata* Ramb. Antennae brown; head, thorax, and abdomen greyish cream-buff, the abdomen showing bands of black-brown scales.—Forewing greyish cream-buff, densely powdered on outer two-thirds, with dark brown scales, basal third only very sparsely powdered with these scales; a brown-black stigma, three spots on costa and a subapical spot dark brown, an antemedian band forked below median vein formed by the brown scales being denser; a black-brown terminal hairline margin.—Hindwing greyish cream-buff densely powdered with dark brown scales; two indistinct discal bands formed by denser scaling and a terminal black-brown hairline border.

Length of forewing: ♂ 10 mm., ♀ 10—12.5 mm.

Some females have the dark scales on forewings so concentrated as to form four discal wavy lines. ♀ Type.

90. *Acidalia luteofasciata* sp. nov.

2 ♂♂, 7 ♀♀, Oued Nça; 3 ♂♂, Guerrara; 1 ♂, sands of El-Arich, S.W. of Touggourt.

♂♀. Legs yellow; rest of body and wings satiny snow-white; a postdiscal broad transverse band on forewings gallstone-yellow.

Length of forewing: ♂ 7.5 mm., ♀ 10 mm. ♀ Type. Allied closely to *gastonaria* Oberth.

LARENTIINAE.

91. *Rhometra sacraria* (Linn.).

2 ♀♀, Bled-el-Ahmar, south of Touggourt.

A very widespread species. Very rare in Great Britain.

92. *Rhometra anthophilaria* ab. *subrosearia* (Stdgr.).

1 ♂, Mraïer half-way between Biskra and Touggourt.

93. *Lithostege notata* Bang-Haas.

5 ♂♂, 1 ♀, Bordj Saada, 3 ♂♂, 2 ♀♀, Bordj Chegga, south of Biskra; 1 ♂, half-way between Touggourt and Ouargla.

This species was described in 1906 from a series from various places in Tunisia.

94. *Lithostege fissurata* Mab.

1 ♀, Bordj Chegga to Kef-el-Dor; 1 ♀, Kef-el-Dor, south of Biskra; 3 ♂♂, half-way between Touggourt and Ouargla; 4 ♂♂, 4 ♀♀, Arefidji, north of Ouargla; 2 ♂♂, 1 ♀, half-way between Ouargla and El-Golea.

This species was described from Morocco. The more southern specimens have a tendency to a browner grey ground colour, but it is not constant.

95. *Orthonama obstipata* (Fabr.).

1 ♀, Nza-ben-Rzig; 1 ♀, Tamerna, north of Touggourt.

96. *Osteodes latimarginaria* Rebel.

1 ♂, Aïn Guettara.

97. *Tephroclystia tenellata* (Dieze).

1 ♂, 2 ♀♀, Arefidji, north of Ouargla; 1 ♂, 3 ♀♀, half-way between Ouargla and El-Golea; 2 ♂♂, 4 ♀♀, north of El-Golea; 1 ♀, Oued Nça.

98. *Tephroclystia tornifascia* sp. nov.

1 ♀, half-way between Ouargla and El-Golea.

♀. Differs at first sight from *tenellata* in that the curved double postdiscal bands on forewing run down to inner margin almost at tornus instead of curving in

and almost joining it together with the median bands. The black marks on costa are larger and wider apart.

Length of forewing : 9.5 mm.

99. *Tephroclystia arenicola* sp. nov.

2 ♀♀, half-way between Onargla and El-Golea ; 1 ♂, 1 ♀, South Oued Mya.

♂♀. Differs from *tenellata* by its sandy buff ground colour, in the parallel transverse lines on both wings being straighter, but much more crenulated, and the distinct dark stigma in both wings.

Length of forewing : ♂ 8.5 mm., ♀ 8—10 mm.

100. *Ptychopoda sordida* sp. nov.

2 ♀♀, El-Golea ; 1 ♂, Oued Nça.

♂♀. Pale yellowish wood-grey, densely powdered with dark brown scales. On the forewings there are five indistinct transverse bands produced by the closer accumulation of the dark scales ; a distinct stigma and three very indistinct bands on hindwing.

Length of forewing : ♂ 6.5 mm., ♀ 8 mm.

**BOARMIINAE.**

101. *Phaselia deliciosaria* Led.

1 ♀, Oued Nça.

The species was described from Asia Minor, and Dr. Chapman took one specimen in Spain. This is the first record for North Africa.

**ARCTIANAE.**

102. *Utetheisa pulchella* (Linn.).

1 ♀, El-Meksa, south of El-Golea ; 3 ♀♀, 3 ♀♀. El-Hadadra, El-Golea to Ghardaïa ; 1 ♂, 1 ♀, Oued Abiod, south of Ghardaïa ; 1 ♀, Ghardaïa ; 1 ♂, Biskra.

The ♀ from Oued Abiod has the black spots strongly reduced and red marks more or less run together, besides being of extra large size, giving it a very striking appearance. This form of variation seems frequent in Algeria, as I have taken similar ones near Alger and at El-Kantara. The species is common all over Algeria.

**PSYCHIDAE.**

103. *Amicta murina mauretunica* subsp. nov.

Living larvae in numbers, sands of El-Arich, between Ghardaïa and Tougourt.

Unfortunately Dr. Hartert, to keep the food fresher, placed these larvae in a close-fitting tin box, and did not open it for some days, with the result that all perished from mildew.

We found these larvae at Biskra and elsewhere every year, but failed to rear them.

♂. Differs from all the other forms of *murina* in the almost opaque wings, which together with antennae, head and body, were uniform mouse-grey. Type, Bou-Saada, emerged September 10, 1912, Victor Faroult.

**Larva:** head yellowish grey with a number of very fine black hairlines; legs yellowish grey ringed and spotted with black; sides and under-surface yellowish grey; back yellowish grey all but the 1st segment, with transverse black bands; on the 2nd to 6th these bands are narrow, followed on 5th and 6th by a black spot; on the 7th to 11th these bands are broad.

The larvae at El-Arich were feeding on *Retama ractam*.

In order to make this description complete the following is a synopsis of the local races of *A. murina*.

*Amicta murina quadrangularis* (Christ.).

Wings transparent, whitish grey margins scaled with sooty grey. PERSIA.

*A. murina nigrescens* (Staud.).

Wings and body sooty black. ARMENIA.

*A. murina albescens* (Staud.).

Wings and body pale yellowish cinnamon buff, considerably larger. PALESTINE.

*A. murina murina* (Klug.).

Uniform greyish white with pale brown costa and abdomen. UPPER EGYPT.

*A. murina mauretunica* Rothsch.

Uniform mouse-grey. NORTH-WEST AFRICA.

The cases of all these forms are alike quadrangular, turret-shaped, and composed of short pieces of plant-stem laid parallel and at right angles.

**COSSIDAE.**

104. *Cossus aries* Püng.

1 ♀, Kef-el-Dor.

When I took a specimen of this insect at light at Tirlhempt in April 1911, there were only two specimens of this species recorded, which had come from Palestine. On comparing my specimen at the British Museum, I was struck by its resemblance to the type of *Cossus aegyptiaca* Hampson; but its author thought it could not be the same as mine, for that insect has light hindwings, while mine had brown-black hindwings like Püngler's type. This year, besides Dr. Hartert's specimen, I received three others from Victor Faroult from Tirlhempt, one of which and Dr. Hartert's are true *aegyptiaca* while the other two are intermediate. This proves that the light hindwinged individuals are not a distinct species, but must stand as *Cossus aries* ab. *aegyptiaca* Hmpsn.

In Part 101 *Palaearetica* Dr. Seitz records a very large specimen from Tunisia and one from Biskra; so, like many other purely desert species, it is very widespread.

105. *Dyspessa suavis* Stdgr.

4 ♀♀, half-way between Ouargla and El-Golea; 1 ♀, north of El-Golea.

This insect is very distinct from *jordana* Standinger, and must in my opinion be treated as a separate species. One reason why its author and others including myself considered it only a form of *jordana*, was because none of us had seen really fine perfect specimens like the present series. I also think that both *jordana* and

*suavis* fit better into the genus *Hypopta* than in *Dysspessa*, but this is a question which would lead much further than any possible scope of this article; it would necessitate a monographic review and revision of the whole families *Cossidae* and *Zeuzeridae*, including the question of whether the alteration of vein 11 in the hindwing in the *Cossidae* really places them among the **Tineinae** in the **Microlepidoptera** while its condition in the *Zeuzeridae* leaves the latter among the **Macrolepidoptera**. In my personal opinion the families *Cossidae*, *Zeuzeridae*, *Hepialidae* and *Micropterygidae* form separate suborders of the order **Lepidoptera** and cannot be placed in any of the families into which that order is divided. *Dysspessa jordana* var. *saharæ* Luc. (= *Cossus saharæ* Luc.) is a ♂ and agrees perfectly with the ♀ I caught in 1909 at Kef-el-Dor. It is therefore only a grey aberration of *Dysspessa suavis*, and must stand as follows: *Dysspessa suavis* ab. *saharæ* Luc. A ♀ sent by Victor Faroult from near Bou-Suada is very grey, and agrees much better with Lucas' description than even mine, though the figure agrees better with the Kef-el-Dor specimen. As, however, all the **recorded** Algerian specimens are ♀ ♀, it is most probable that *saharæ* is only the ♂ of *suavis* after all.

#### PYRALIDAE.

##### CRAMBINAE.

#### 106. *Surattha strioliger* sp. nov.

1 ♂, 1 ♀, Arefidji, north of Ouargla; 2 ♂ ♂, half-way between Touggourt and Ouargla.

♂. Head greyish cream-buff; antennae strongly pectinated, shaft creamy white, pectinations black; thorax wood-brown, tegulae and patagia greyish cream-buff; abdomen greyish brown-buff.—Forewing: buffish sandy grey nervures cream-colour; a subbasal black streak above and a basal one below vein 1, a subbasal and postmedian broad transverse brownish cloud composed of intraneural striae; on outer half intraneural streaks of blackish scales.—Hindwing yellowish semi-hyaline grey, abdominal area more creamy yellow.

♀ has clouding and intraneural streaks and striae darker. The Arefidji ♂ has forewings all cream-buff and very few striae and streaks.

Length of forewing: ♂ 14—16 mm., ♀ 14.5 mm.

#### 107. *Eromene ramburiella lutiella* Caradja.

1 ♂, Oued Nça.

#### 108. *Eromene bella raddella* Caradja.

1 ♀, Igosten, Tidikelt.

Both these *Eromenes* were described in 1910 from Biskra.

#### PHYCITINAE.

#### 109. *Myelois nivosella* Rag.

1 ♀, half-way between Touggourt and Ouargla; 1 ♂, half-way between Ouargla and El-Golea.

#### 110. *Nephoptyx cleopatrella* Rag.

1 ♀, Bordj Chegga; 3 ♂ ♂, 3 ♀ ♀, Kef-el-Dor.

111. *Salebria komaroffi* Rag.

5 ♂♂, 2 ♀♀, Oued Nçā.

Described from Central Asia.

112. *Salebria ragonoti* sp. nov.

1 ♀, El-Golea.

♀. Head, antennae, thorax, and abdomen buffy whitish grey.—Forewing buffy greyish white; base, basal fifth of wing below vein 1, an antemedian band and a postdiscal obsolete band reddish grey.—Hindwing buffy greyish white.

Length of forewing: 10.5 mm.

113. *Tephris veruculella aridiella* subsp. nov.

1 ♂, north of Ain Guettara; 1 ♂, 2 ♀♀, South Oued Mya.

♂♀. Differs from *v. veruculella* in the rosy sand-colour, **not** silvery mouse-grey, of the forewings, and considerably larger size.

The typical form was described by Ragonot from Syria, and there is a specimen from Northern Tunisia in the British Museum.

114. *Tephris obliquivitella* sp. nov.

1 ♀, Oued Abiod, north of In-Salah.

♀. Head, antennae, thorax, and abdomen sandy greyish wood-brown, tegulae and patagia with patches of sooty scales.—Forewing rosy wood-grey sprinkled with sandy scales: an oblique sooty black antemedian band with two outward black loops, an oblique sooty median line from costa to median fold, and a double oblique postdiscal band running from costa before apex joins the median band forming a large V, a terminal row of black dots.—Hindwing silky white with terminal wood-brown line.

Length of forewing: 12 mm.

115. *Staudingeria calcariella* Rag.

1 ♀, Ain Guettara.

116. *Staudingeria deserticola* Staud.

1 ♀, Hassi el-Hadjar; 1 ♂, 1 ♀, half-way between Onargla and El-Golea; 2 ♀♀, north of El-Golea.

Described from Sarepta.

117. *Staudingeria yerburyi* Butl.

1 ♂, El-Meksa; 1 ♀, Hassi el-Hadjar.

Described from Aden.

118. *Staudingeria calcariellina* sp. nov.

1 ♀, Hassi el-Hadjar.

♀. Differs from *calcariella* in the forewings and thorax being silvery ash-grey with sandy wood-brown fringe to former; one-third from base on vein 1 is a brown patch and a similar streak on outer third; a row of dark subterminal striae, and the whole forewing sparingly powdered with dark scales.



119. *Staudingeria aspilatella* Rag.

1 ♂, 1 ♀, Oued Nça ; 1 ♀, Bled-el-Ahmar, south of Touggourt.  
Described from Askabad.

120. *Heterographis ochrotaeniella* Rag.

1 ♀, north of In-Salah.  
The type came from Ordnbad.

121. *Heterographis sabulosellus* Stdgr.

1 ♀, El-Meksa.  
Described from Nochur.

122. *Heterographis brabantella* D. Lucas.

1 ♂, half-way between Touggourt and Onargla ; 1 ♀, half-way between Onargla and El-Golea ; 1 ♀, South Oued Mya.  
Described from Algeria.

123. *Heterographis carnea* Rothsch. and Warr.

1 ♂, El-Meksa.  
My brother got the type in Egypt.

124. *Syria variabilis* sp. nov.

1 ♂, 3 ♀ ♀, Hassi el-Hadjar ; 1 ♀, El-Meksa  
♂ ♀ appears in two phases with intermediates.

I. **Dark phase.** Antennae whitish with brown serrations ; head, thorax, and abdomen rufous wood-brown.—Forewing, costal third buffy cream, median third rusty black-brown, and lowest third brownish sandy yellow, irrorated with brown scales.—Hindwing satiny greyish white, terminal edge wood-grey.

II. **Light phase.** Antennae, head, and body paler. Forewing cinnamon buff slightly sprinkled with brownish scales, above subcostal vein buffish cream-colour.

The El-Meksa ♀ has the brown scaling on the wings much stronger and the pale costal area absent.

Length of forewing, ♂ 11—12.5 mm., ♀ 11.5—14 mm.

125. *Syria fuliginosa* spec. nov.

1 ♀, Mraïer.

♀. Antennae black ; head rufous ; thorax black-brown, tegulae rufous, patagia rufous tipped with greyish buff ; abdomen variegated black-brown and greyish.—Forewing brown-black, a subbasal patch and costal area buffy grey powdered with black scales, a subbasal rufous patch between vein 1 and inner margin, a postdiscal whitish waved transverse line followed by a large rufous patch from tornus to vein 6, fringe variegated grey and brown.—Hindwing silky wood-grey.

Length of forewing, 12 mm.

126. *Homeosoma privata* Wlk.

1 ♀, South Oued Mya.

**ANERASTIINAE.**

127. **Baroda minutella** Hmps. n.

1 ♀, Arefidji, north of Ouargla.  
Described from Deesa, India.

128. **Prophtasia platycerella** Rag.

2 ♂♂, 3 ♀♀, South Oued Mya.  
This species was described from Central Asia.

129. **Saluria maculivittella** Rag.

1 ♀, north of El-Golea; 1 ♂, 1 ♀, South Oued Mya.  
This insect was described from the Caucasus.

130. **Lymire lactealis** sp. nov.

1 ♂, half-way between Ouargla and El-Golea; 1 ♀, Igosten, Tidikelt; 1 ♂, north of El-Golea.

♂♀. Antennae strongly serrate, white, serrations brown; head cream-white; thorax and abdomen greyish sandy buff.—Forewing creamy sandy buff, above and on subcostal vein creamy white.—Hindwing semihyaline silky cream-white.  
♀ Type.

Length of forewing, ♂ 13·5 mm., ♀ 12·5 mm.

131. **Anerastia ablutella** Zell.

2 ♀♀, Oued Nça.

132. **Anerastia majorella** sp. nov.

1 ♀, half-way between Ouargla and El-Golea.

♀. Similar to *ablutella*, but much larger. Head, antennae, and thorax buffy lemon-yellow; abdomen buff.—Forewing buff lemon-yellow with brown discocellular dot.—Hindwing semihyaline white.

Length of forewing: *ablutella* 6·5 mm.

” ” *majorella* 10 mm.

**GALLERIINAE.**

133. **Arenipses sabella** Hmps. n.

1 ♂, 1 ♀, In-Salah.

This species was described from Fao on the Persian Gulf.

134. **Enosoma albicantalis** sp. nov.

1 ♂, 2 ♀♀, north of El-Golea; 1 ♂, 1 ♀, south of El-Golea; 1 ♂, 1 ♀, Oued Nça; 1 ♀, sands of El-Arich, S.W. of Tougourt.

♂♀, Head, antennae, thorax, and abdomen pale sand-colour.—Forewing uniform buffy pinkish cream-colour.—Hindwing satiny cream-white.

Length of forewing, ♂ 13·5—15 mm., ♀ 12·5—15·5 mm.

**PYRALINAE.**

135. *Crocalia aglossalis* Rag.

1 ♀, South Oued Mya.

136. *Ulotricha algerialis* Hmps.

2 ♀ ♀, north of El-Golea ; 8 ♂ ♂, 4 ♀ ♀, Oued Nça.

The beautiful apple-green of the discal third of forewing soon fades if the specimens are relaxed: like *Zygaenidae* and green *Geometridae* they ought to be set when fresh, but on a long difficult desert journey this would be impossible.

137. *Aglossa rubralis* Hmps.

1 ♀, half-way between Touggourt and Ouargla ; 1 ♂, half-way between Ouargla and El-Golea ; 2 ♂ ♂, South Oued Mya.

This species was described from Biskra.

138. *Aglossa cuprealis* Linn.

1 ♀, South Oued Mya.

A wide-ranging species.

139. *Constantia myalis* sp. nov.

5 ♂ ♂, 3 ♀ ♀, South Oued Mya.

♂. Head, thorax, and abdomen sandy buff, strongly powdered with rufous scales ; antennae strongly pectinated, shaft whitish, pectinations brown.—Forewing brownish buff, densely clothed with brownish rufous scales ; an antemedian serpentine and a postmedian strongly curved and angled transverse line white ; a white terminal line, fringe dotted with white.—Hindwing buffish wood-grey, densely clothed with sandy rufous scales, with an obsolete shadowy postdiscal line, fringe chequered with white.

♀ much larger.

Length of forewing : ♂ 9—12 mm. ; ♀ 15—16.5 mm.

140. *Constantia longidentalis* sp. nov.

1 ♂, half-way between Ouargla and El-Golea.

♂. Head testaceous buff ; antennae strongly and evenly pectinated, brown ; thorax and abdomen buffish wood-brown.—Forewing pale wood-brown, densely covered with dark brown scales ; an antemedian angled band buff edged outwardly with dark brown, a buffish white spot with deep brown one joined on at apex of cell, a postdiscal cream-buff transverse band from which runs in to middle of wing along median fold a large wedge-shaped patch.—Hindwings wood-grey with whitish postdiscal band.

Length of forewing : 11.5 mm.

141. *Constantia syrtalis* Rag.

1 ♀, Mraïer, between Biskra and Touggourt.

142. *Constantia canifusalis* Hmps.

2 ♂ ♂, south of El-Golea ; 1 ♂, 1 ♀, El-Meksa.

This species was described from the neighbourhood of Biskra.

143. *Constantia poliopastalis* Hmps.

2 ♂♂, 1 ♀, half-way between Ouargla and El-Golea.  
This was also described from Biskra.

144. *Constantia bleusei* Oberth.

1 ♂. South Oued Mya.

145. *Constantia dilutalis* sp. nov.

1 ♀, In-Salah.

♀. Head, antennae, thorax and abdomen greyish sandy buff.—Forewing whitish, clouded all over with sandy greenish buff; a transverse light antemedian line and a curved darker postdiscal line.—Hindwing satiny semihyaline cream-white.

Length of forewing: 12 mm.

146. *Constantia aridalis* sp. nov.

2 ♀♀, South Oued Mya.

♀. Head, antennae, thorax and abdomen sandy brownish orange.—Forewing sandy buff, densely clothed with brownish orange scales; a row of obsolete darker dots along costa and termen.—Hindwings buff with obsolete darker discal line.

Length of forewing: 10–12 mm.

147. *Constantia* species?

1 ♂, Batna.

The specimen is very rubbed and not at present identifiable.

148. *Tretopheryx numidalis* Hmps.

1 ♀, Oued Abiod, south of Ghardaia.

**PYRAUSTINAE.**

149. *Evergestis renatalis* Oberth.

1 ♀, South Oued Mya.

150. *Nomophila noctuella* Schiff.

1 ♀, Bordj Chegga; 1 ♂, 1 ♀, Hassi el-Hadjar; 2 ♂♂, half-way between Ouargla and El-Golea; 10 ♂♂, 7 ♀♀, South Oued Mya; 1 ♀, north of Aïn Guettara; 1 ♀, In-Salah; 1 ♂, Oued Nça.

This is one of the widest-spread and commonest of the Palaearctic *Pyralidae*. It varies much in colour and marking, from wood-brown with heavy black bars and dark brown striae to pale wood-brown with no apparent markings.

151. *Mecyna gilvata* Fabr.

1 ♀, north of Aïn Guettara; 1 ♂, Oued Nça.

This is a world-wide species, though not very abundant anywhere.

152. *Calamochrous rufoarenalis* sp. nov.

2 ♀♀, north of Aïn Guettara.

♀. Head, antennae, thorax, and abdomen cinnamon rufous sand-colour.—Forewing cinnamon sand-colour, densely covered with cinnamon rufous scales; an

oblique curved antemedian and a similar postmedian transverse line, darker rufous.—Hindwing rufous cinnamon sand-coloured.

Length of forewing : 13·5—15 mm.

153. *Cybolomia arenalis* Hmps.

1 ♀, Bordj Chegga ; 1 ♂, Mraïer, between Biskra and Touggourt.

Described from Biskra region.

154. *Metasia pseudobotys* sp. nov.

1 ♂, 1 ♀, South Oued Mya.

♂. Antennae very long, pale sandy brown ; head and thorax sandy brownish yellow ; abdomen long, buffish sand-colour.—Forewing sandy brownish yellow ; a black spot at base of costa, an interrupted blackish antemedian line, a blackish streak at end of cell, just beyond which is an interrupted blackish transverse line, a postdiscal blackish transverse line from costa to vein 2, and a terminal line of blackish streaks.—Hindwing slightly paler than forewing, with faint traces of discal line.

♀. Smaller, with much shorter antennae, and the lines on forewing fainter.

Length of forewing : ♂ 12 mm., ♀ 9·5 mm.

Length of antennae : ♂ 16 mm., ♀ 7 mm.

The long antennae and body and general facies of the ♂ give this insect at first sight a very *Botys*-like appearance.

155. *Metasia mzabi* sp. nov.

1 ♂, Oued Nça.

♂. Head white ; antennae yellowish ; thorax and abdomen ochre-yellow, ends of patagia white.—Forewing white ; basal fourth, costal area, and outer fifth of wing sandy brownish orange ; a large stigma sandy yellow encircled with brown ; an antemedial straight and a postmedial curved transverse band chocolate-brown, a very thin terminal brown hairline ; fringe chequered brownish and white.—Hindwing white ; stigma, a faint postdiscal band and a terminal band sandy brownish orange, fringe white with dark dots.

Length of forewing : 11 mm.

156. *Cornifrons ulceratalis* Led.

1 ♀, Bordj Chegga ; 1 ♂, 3 ♀♀, Nza ben Rzig ; 2 ♂♂, 7 ♀♀, half-way between Touggourt and Ouargla ; 1 ♂, 21 ♀♀, Hassi el-Hadjar ; 3 ♀♀, half-way between Ouargla and El-Golea ; 1 ♂, 2 ♀♀, north of El-Golea ; 1 ♀, north of Aïn Guettara ; 1 ♀, Aïn Guettara ; 1 ♀, Igosten, Tidikelt ; 1 ♀, In-Salah.

This species was redescribed by Oberthür under the name of *Scoparia serizatalis*.

It is a most variable species, ranging from pale wood-brown with heavy black-brown bands and patches to pale sandy yellow with no markings at all.

157. *Noctuelia desertalis* Hübn.

1 ♀, half-way between Touggourt and Ouargla ; 3 ♂♂, 3 ♀♀, Hassi el-Hadjar ; 4 ♂♂, 6 ♀♀, half-way between Ouargla and El-Golea ; 1 ♂, 2 ♀♀, north of El-Golea ; 1 ♀, South Oued Mya ; 1 ♂, 1 ♀, Aïn Guettara.

## MICROLEPIDOPTERA.

## TINEIDAE.

*Catabola*, gen. n. (Drnt.), (καταβολή = a beginning.)

Type: *Tincola biskraëlla* Rbl.

Antennae = 1, thick, joints short, basal joint widened, without pecten; labial palpi moderate, porrect, densely scaled, median joint with a few apical setae; maxillary palpi, haustellum, and ocelli obsolete; head and face roughly tufted; thorax with appressed scales.—Forewing ovate-lanceolate, dorsum slightly impressed at vein 1; venation: eleven veins, 8 absent (coincident with 7 or 9); 7—9 stalked, 7 to costa; 2—4 about equidistant, 4—5 short-stalked, media to below 6, 11 from before middle, 1 basally furcate.—Hindwing ovate-lanceolate; venation: eight veins, all separate, the distances between each evenly diminishing from 2—6, media to above 6, 6 nearer to 5 than to 7; abdomen flattened; legs, hind-tibiae hairy above.

Slide: ♂ (96999) Mus. Wlsm. B.M.

The face is excavate between the eyes, but this is probably characteristic of the ♂ only.

Allied to *Promasia* Chrtn., *Stathmopolitis* Wlsm., and *Malacyntis* Meyr. (Drnt.).

158. *Catabola biskraëlla* (Rebel).

1 ♂, South Oued Mya.

Described from Biskra.

Has been recorded from Biskra by Rev. A. E. Eaton, and from Hammam-es-Salahin, near Biskra, by Lord Walsingham.

159. *Episcardia lardatella* Ld.

1 ♀, north of Aïn Guettara; 1 ♂, South Oued Mya.

Described from Syria in 1858, this species has been recorded from Lambessa, Aurès Mountains, by Chretien in 1904, and by Joannis from Tunisia in 1911. It has also been got by the Rev. A. E. Eaton at Biskra in May 1894 and April 1895.

## TORTRICIDAE.

160. ?

1 ♂, Oued Nça; in too bad condition for identification.

## GELECHIADAE.

161. *Oecocercis guyonella* Gn.

Dr. Hartert brought home a large number of galls of this species collected in June between Elalia and Touggourt on *Limoniastrum guyonianum*. I collected them myself in 1908 at Biskra, and there are specimens from the same place collected by the Rev. A. E. Eaton. At the time of writing (November 1, 1912) the galls collected by Dr. Hartert contain full-grown living larvae.

162. *Phthoimaea eremaula* Meyr.

1 ♀, Kef-el-Dor. Is in very poor condition.

In conclusion I have to thank Mr. L. B. Prout and Mr. J. H. Durrant for working out the *Geometridae* and the *Microlepidoptera*, and Sir George Hampson for the great assistance he afforded me with the *Noctuidae* and *Pyralidae*. The new genus *Catabola* is described by Mr. Durrant. I have described in this article 35 new species, 3 new subspecies, and 5 new aberrations out of Mr. Hartert's Saharan collection, and 1 new species and 6 new subspecies from elsewhere.

## VIII.

## SIPHONAPTERA.

By K. JORDAN, PH.D., AND THE HON. N. CHARLES ROTHSCHILD, M.A.

THE sixteen specimens of fleas collected during Dr. Hartert's expedition to In-Salah belong to four different species of *Xenopsylla*, one of the species being new to science. The genus *Xenopsylla* is typical of the deserts and steppes of temperate Africa and Asia, although in the tropics the genus is by no means restricted to desert regions. None of the species of *Xenopsylla* occur in Western and Central Europe, with the exception of *X. cheopis*, which has become cosmopolitan with its hosts, the rats frequenting ships.

1. *Xenopsylla cleopatrae* Roths. (1903).

4 ♀ ♀, from Fort Miribel, 138 km. south of El-Golea, 5. iv. 1912, off *Dipodillus campestris rozsikae*.

1 ♂ 1 ♀, from Oued el-Abiod, north of In-Salah, 24. iv. 1912.

1 ♀, from the Southern Oued Mya, 7. v. 1912, on bed in tent.

The species likewise occurs on the Central Plateaux of Algeria, and is also recorded from Egypt and the Sudan.

2. *Xenopsylla nubicus* Roths. (1903).

1 ♂, 3 ♀ ♀, from 85 km. south of El-Golea, 10. v. 1912, off *Jaculus jaculus*.

One of the ♀ ♀ is possibly *X. chersinus* Roths. (1906).

The species is known from Egypt and Syria.

3. *Xenopsylla regis* Roths. (1903).

1 ♂, 1 ♀, from Fort Miribel, 138 km. south of El-Golea, 5. iv. 1912, off *Dipodillus campestris rozsikae*.

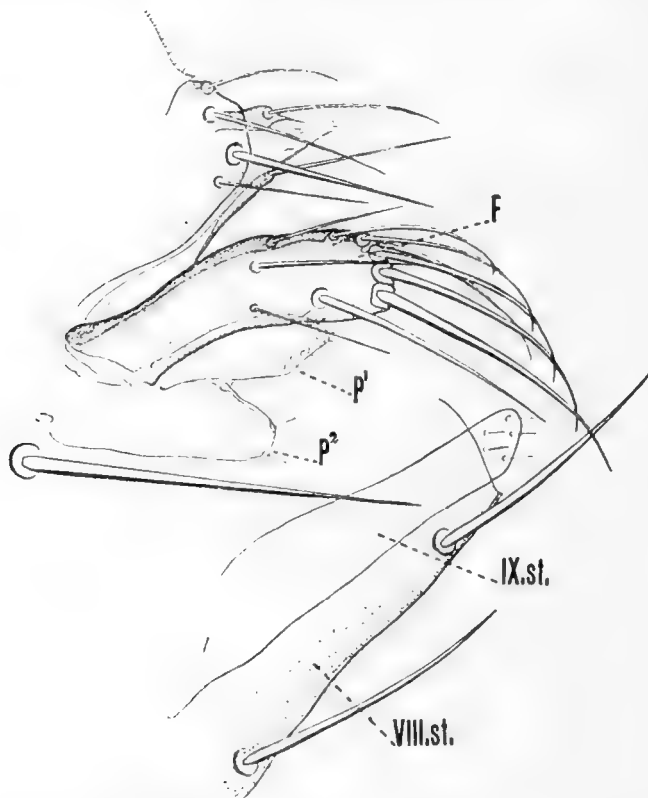
The species was originally described from Lahej in South Arabia.

Apart from the bristles and the genital organs, *X. regis* is characterised by the genal edge being widened downward into a broad and obtuse lobe. This lobe is much longer and more triangular than in the allied species, but shorter and blunter than the hook-like genal lobe of *Pariodontis riggenbachi*.

4. *Xenopsylla taractes* spec. nov. (text-fig.).

2 ♂♂, from half-way between Ouargla and El-Golea, 19. iii. 1912, off *Meriones schousboei*.

A close ally of *X. mycerini* Roths. (1904) and *X. ramesis* Roths. (1904). It is nearer to the former, the ♂ bearing two ventral bristles on each side of the eighth abdominal sternite as in *mycerini*, whereas this segment of *ramesis* has a row of bristles instead. The genital armature of the ninth tergite consists of three processes. The upper (and outer) process, F in text-fig., is the largest.



Modified abdominal segments of ♂ of *X. taractes*.

It is less broad at the apex than in *X. ramesis*, and also less markedly truncate than in that species, while it is rather broader apically than in *X. mycerini*. The number of bristles on this process and their size are slightly variable. The processes P<sup>1</sup> and P<sup>2</sup> (cf. text-fig.) are much less chitinised than process F. In *X. mycerini* process P<sup>1</sup> almost reaches to the apex of process F, but in the present species it is much shorter than F, being also broader than the corresponding process of *X. mycerini*. Process P<sup>2</sup> is different in shape from that process of *X. mycerini* and *ramesis*, and bears two minute hairs. The ninth sternite (ix. st.) is rather broad throughout, with the apex obliquely rounded, as shown in the figure,



## IX.

## PFLANZEN.

VON PROF. DR. G. SCHWEINFURTH.

[Die Reise wurde zu zoologischen Zwecken unternommen und Pflanzen konnten nur gelegentlich nebenher gesammelt werden. Da ich ausserdem nur sehr geringe botanische Kenntnisse besass, mussten die Beobachtungen auf wenige Arten beschränkt bleiben und manche Mitteilungen über nur Beobachtetes mussten unterbleiben, um nicht in Irrtümer zu verfallen. Diese Sammlung ist dem Königl. Botanischen Museum in Dahlem bei Berlin überwiesen worden.—E. H.]

**CHARACEAE.**1. *Chara foetida* L. var.

[Diese Wasserpflanze war ungemein häufig in den Wassergräben der Oase von In-Salah.\*—E. H.]

**GRAMINACEAE.***Aristida pungens* Desf.

[Der "Drin" der Araber ist weitverbreitet in den Flugsandgebieten, von den Dünen zwischen Touggourt und El-Oued und Bledet-Ahmar bis zum Flussbette des Oned el-Abiod südlich von Aïn Guettara.

Der Drin ist eine wertvolle Futterpflanze der Kamele, Pferde und Maultiere, und wird auch in getrocknetem Zustande hier und da in den Oasen verkauft. Auch werden die Samen trotz ihrer Kleinheit hier und da gesammelt und als Nahrungsmittel der Menschen verwertet.

Prof. Koenig (*Reisen und Forschungen in Algerien*, p. 60 u.a.) spricht an mehreren Stellen von "Halfa," das bei Bledet-Ahmar und anderwärts in der Sahara vorkommen soll. Indes ist Halfa (*Stipa tenacissima* L.) eine Pflanze der "Hauts Plateaux" und der Atlasvorberge und kommt südlich von Biskra nicht mehr vor, reicht auch weiter westlich nicht weiter als Laghouat nach Süden hinunter. Jedenfalls hat Koenig *Aristida pungens* oder eine *Andropogon*-Art mit dem eigentlichen Halfa verwechselt.—E. H.]

*Stipa tortilis* Desf.

[Bei Chegga und anderwärts südlich von Biskra häufig, hier und da kleine Flächen bedeckend. Beliebte Nahrungspflanze von Gazellen und Hasen.—E. H.]

2. *Aristida plumosa* Vahl.

Durch die grossen Wüstengebiete der nördlichen Hemisphaere von Marokko über Aegypten bis nach Persien und Arabien verbreitet bevorzugt dieses andauernde Federgras die Sandflächen der Dünenhügel, siedelt sich aber ebenso

\* Die Namen der Oertlichkeiten sind nach französischer Orthographie, der auf den Karten dieser Landesteile üblichen entsprechend, wiedergegeben.

dauernd auf steinigem Grunde an, zwischen Gerölle, in Felstrümmern und in den Spalten des festen Gesteins. Die Araber haben in allen Gebieten für diese Art und für die nächstverwandten denselben Namen "nssi" oder "nessi." Alle Aristiden gelten trotz der Winzigkeit ihrer Hame für eine vorzügliche und besonders nährkräftige Weide der Kamele.

[Wurde in Menge im Oued Saret, nördlich von Fort Miribel, und unmittelbar südlich vom Plateau von Tademaït gefunden. Beliebte Gazellenweide. Oft beetartig kleine Flächen bedeckend. Auch im Oued-Nça (Nssa oder Nessa) zwischen Ghardaïa und Guerrara.—E. II.]

### 3. *Andropogon annulatus* Forsk.

Eine Grasart von ausserordentlicher Verbreitung in Ländern sehr verschiedenartiger Klimate. In Aegypten ist sie für die schwarze Nilerde charakteristisch, obgleich sie sich immer an unbewässerten Stellen, vornehmlich an Weg- und Felldrändern ansiedelt. In die Oasen der Sahara wird sie wohl durch die Kulturpflanzen gelangt sein; in den östlichen Saharagebieten scheint sie zu fehlen, aber im Süden von Marokko, Algerien und Tunesien wird sie vielfach angegeben. Die Art ist auch in den Halbwüsten und Steppengebieten von Nubien, Arabien, Indien, China, Australien u.s.w., vielfach eingesammelt worden.

[In grosser Menge an mehreren Stellen am Ufer des südlichen Oued Mya, besonders beim Tilmas Djilrhempt.—E. II.]

### 4. *Andropogon laniger* Desf.

In den Steppen und Halbwüsten von Nubien, Abessinien, Arabien und Nordwest-Vorderindien ebenso verbreitet wie in den Wüstentälern von ganz Klein-Afrika wächst diese Art hier, immer nur als Büschelgras, mit Vorliebe zwischen Steinen, Felstrümmern und Geröll an den Ablängen der Talwände. In den Sahara-Gebieten entwickelt dieses in Indien neben zwei anderen verwandten Arten zur Destillation des wertvollen "lemon-oil" (Citronengrasöl) dienende Gras einen besonderen Reichtum an dem ätherischen Oel, der es auszeichnet. Alle Weidetiere verschmähen das stark aromatische Gras.

[Massenhaft im Oued-Saret, nördlich von Fort Miribel.—E. H.]

### 5. *Pennisetum ciliare* Link.

Auf steinigem Terrain, im Gerölle der Talbetten oder auf den Felsgeschieben am Rande der Rinnsale gedeiht diese in Büschelform sprossende Grasart, die als Weide keinen Futterwert zu haben scheint. Sie ist von den Canarischen Inseln über Marokko und Klein-Afrika bis nach Tripolitanien, Aegypten und Persien verbreitet und wird auch im Caplande als einheimisch betrachtet. Diese Art ist nicht auf die eigentliche Wüste beschränkt, sondern findet in jedem Gelände von allgemein desertischem Charakter ihre Lebensbedingungen.

[In Menge im Oued Saret.—E. H.]

## CYPERACEAE.

### 6. *Scirpus holoschoenus* L.

[In Menge beim Tilmas-Ferkla im südlichsten Oued-Mya-Gebiet.—E. H.]

**LILIACEAE.**7. *Asphodelus tenuifolius* Cav.

Die überall von Arabern mit dem Namen "beruak" bezeichnete Pflanze ist in den Wüstentälern gewöhnlich im Sande oder auf den Tonanschwemmungen der Rinnale anzutreffen. Sie ist durch das Gesamtgebiet der Region der Dattelpalme bis nach Nordwest-Indien von weitester Verbreitung. In vielen Wüstengebieten bedienen sich die Bewohner der weichen, lauchartigen, aber ziemlich geschmacklosen Blätter als Zutat zu Speisen, nach Art des Spinats.

[Im Bette des Oued Saret und in grosser Menge, besonders beim Tilmas-Ferkla mitunter ganze Flächen bedeckend, an den Ufern des südlichsten Oued-Mya. Hieran leben im südlichen Oued-Mya-Gebiet die Raupen von *Celerio lineata livornica*.—E. H.]

**CHENOPODIACEAE.**8. *Anabasis articulata* Moq.-Tand.

Diese Art, das "adjeram" aller arabisch sprechenden Wüstebewohner, ist von Südspanien aus durch die algerisch-tunesischen Wüsten des nördlichen Sahara-Gebiets und über Tripolitanien bis nach Aegypten und Syrien verbreitet. Sie wächst vornehmlich auf steinigem oder felsigen Terrain.

In den beiden letztgenannten Gebieten ist sie im sterilen Zustande leicht mit dem *Haloxylon Schweinfurthii* Aschers. zu verwechseln, im nördlichen Westsahara-Gebiet aber wird man sie von dem dort häufigen *H. salicornicum* Bunge jederzeit leicht durch die weit derberen, doppelt so dicken und kurztriebigen Aeste unterscheiden können.

[An vielen Stellen der nördlichen Hammada beobachtet. Probe vom Safet Iniquel nördlich von El-Golea mitgebracht.—E. H.]

9. *Haloxylon articulatum* Bunge.

Diese von Südspanien aus über Marokko durch das ganze afrikanische Wüstengebiet bis nach Syrien hinein verbreitete Art unterscheidet man im sterilen Zustande von den ähnlichen Arten dieser Pflanzenklasse durch die besonders dünnen aber nicht sehr langschüssigen, sondern mehr gedrängten und viel verzweigten Asttriebe. Ein eigentümliches Dunkelgrün macht die Art in der freien Natur besonders kenntlich.

Im Herbar nehmen die eingelegten Exemplare bald eine schwärzliche Färbung an, was bei den anderen Arten, die dieser ähnlich sehen, nicht vorkommt. Stellenweise bildet diese Art ein ansehnliches Strauchwerk. Sie wächst auf steinigem Terrain aber auch auf Flächen mit Tonablagerung in der Tiefe der Talbetten. Besonders verbreitet ist sie auch im nördlichen Teil der Libyschen Wüste.

[Auch diese Art wurde in dem artenreichen Bette des Oued Saret und in der Hammada, an Stellen mit angewehem Sande, zwischen Ghardaïa und Tonggourt gesammelt. Die Araber nannten sie "remeth".—E. H.]

10. *Haloxylon salicornicum* Bunge

(= *H. Schmittianum* Pom.).

Man hat diese Art neuerdings mit dem in den nördlichen ägyptischen Steinwüsten häufigen *H. Schweinfurthii* Aschers. vereinigen wollen, letztere aber

unterscheidet sich von ihr, ausser anderen Merkmalen, auf den ersten Blick durch den weit robusteren Wuchs und die dickeren Aeste. Die vorliegende Art ist auf die algerisch-tunesisch-tripolitanische Wüstenregion beschränkt und wächst vorzugsweise auf festem Kalkfels, so beispielsweise bei Hammam-Salabin nahe Biskra. Sie ist durch kreideweisse, dünne langschüssige Aeste, die ohne Verzweigung bis auf 50 cm. anwachsen, und durch sparrig-niederliegende Verzweigung gekennzeichnet. Kleine tannenzapfenähnliche Gallengebilde, hervorgegangen aus gedrängten Kurztrieben, treten an den Zweigen häufig auf und dienen gleichfalls zur Charakterisierung der Art.

[Wurde im Menge in den Hammadas der Mzab-Gegend gefunden, vielleicht auch noch weiter südlich, doch vermochte ich die verschiedenen Chenopodiaceen nicht ohne Vergleich zu unterscheiden, sodass meine Notizen darüber wertlos sind. —E. H.]

### 11. *Traganum nudatum* Del.

Ueberall, wo die Wüstenbewohner das Arabische zur Muttersprache haben wird die Art "Dhamerän" genannt. Sie ist eine ausgesprochene Felsenpflanze, die am üppigsten in den Spalten des festen Kalksteins gedeiht. Da sie mit den Merkmalen ihrer vegetativen Tracht einen ausserordentlich weiten Formenkreis entwickelt, ist es nicht immer leicht diese Art im sterilen Zustande von ähnlichen Salsolaceen zu unterscheiden, so beispielsweise von dem ihr hinsichtlich des Wuchses und der glänzenden weissen Aeste einigermaßen gleich kommenden *Halogeton alopecuroides* Moq.-T. Durch die stets reinweissen (ungegliederten) Aeste, an denen die meist kurzen Blätter mit stets verbreiteter Basis aufsitzen, ist das *Traganum* zunächst kenntlich.

Die Blätter sind im Umriss mehr oder minder von länglich dreieckiger Gestalt, die älteren stets mit der Fläche nach unten hakig umgebogen und an der Spitze selbst stumpf oder mit einem derben und kurzen Stachelfortsatz versehen, nicht, wie das erwähnte *Halogeton*, in einen feinen fast grannenartigen oder sehr langen Mucro ausgezogen. Das *Traganum* ist durch das ganze nördliche Sahara-Gebiet von Marokko bis nach Aegypten und weiter bis in das petrische Arabien und nach Palaestina hinein verbreitet.

[Auch diese Art mag mitunter mit verwandten Pflanzen verwechselt worden sein, aber nach meinen Notizen funden wir sie auf dieser Reise nur in drei Gegenden: zwischen Ghardaia und Touggourt (in der Mzabgegend), in dem wundervollen Tale mit felsigem Untergrund inmitten des grossen "Erg-bent-Chaouli" unweit von El-Meksa südlich von El-Golea, wo wir am 2. April lagerten, und in abgestorbenem Zustande nördlich von In-Salah.

Rohlf's (s. *Reise durch Marokko*, u.s.w., Bremen, 1868) erwähnt den "Domrahn"—so sprachen es auch unsre Araber aus—als weite Flächen östlich und westlich von In-Salah bedeckend; er spricht verschiedentlich vom "Domrahn-Walde," was eine Uebertragung des arabischen "Rhaba" (= "Wald") (s. Rohlf's, t.c. p. 124), aber sehr irreführend ist, da der Domrahn kaum höher als 60 cm. wird. Damals (1864, 1865) waren die Flussbetten in und bei Tidikelt weithin grün von Domrahn und anderen Pflanzen, und boten somit den Kamelen reichliche Nahrung. Heutzutage ist aller Domrahn und jede andere Pflanze in der Umgegend von In-Salah abgestorben, weil es Jahrzehnte lang nur ungenügend geregnet hat. Durch Ausgraben der Pflanzen zwischen In-Salah und dem Oued-el-Abiod überzeugten wir uns davon, dass sie endgültig abgestorben seien. Vergebens verlangte

ich lebenden Domrahn zu sehen ; es gab nicht eine Pflanze weit und breit. "Aber Du hast Domrahn oft nördlich von Touggourt gesehen und wir werden Dir die erste lebende Pflanze zeigen, die wir sehen," sagten unsere Leute. Das geschah denn auch am Lagerplatze im "Erg-bent-Chaouli," und dann erst wieder zwischen Ghardaia und Touggourt. Alle diese Plätze hatten felsigen Untergrund mit angewehtem Sande. Die Kamele fressen die Pflanze nicht ungerne.—E. H.]

### CARYOPHYLLACEAE.

#### 12. *Gymnocarpus decander* Forsk.

(= *fruticosus* F.).

Safet-Iniquel, 23. iii. 1912.

Ein sparrigvielerzweigtes niederes Gestrüpp, das felsiges Terrain bevorzugt und im gesammten Wüstengebiet der alten Welt von Marokko bis nach Persien hin verbreitet ist. Ueberall liefert es mit seinem holzigen, aber safterfüllten Astwerk den Kamelen ein besonders willkommenes Futter.

[Wurde auf felsigem Boden am Safet Iniquel, nördlich von El-Golea gesammelt.—E. H.]

#### 13. *Dianthus serrulatus* Desf.

Die Art soll das ganze Jahr hindurch im Schmuck seiner rosa Blüten anzutreffen sein. Sie ist eigentlich ein Gewächs des Tel des algerischen Berglandes und im Gesamt-Gebiet von Klein-Afrika auf Brachen und in Buschwerk verbreitet. In die Oasen der nördlichen Sahara ist sie wohl nur durch den Ackerbau verbreitet worden.

[Wir fanden sie indessen in Menge in dem unbewohnten Sandgebiete El-Arich, südwestlich von Touggourt, im Juni in Blüte.—E. H.]

#### 14. *Paronychia longiseta* Webb.

[Wurde im Gebiet des südlichsten Oued Mya eingesammelt.—E. H.]

#### 15. *Silene villosa* D. (?)

[Im pflanzenreichen Oued Saret am 3. April gefunden.—E. H.]

### CAPPARIDACEAE

#### 16. *Capparis spinosa* L. var. *ovata* Desf.

Eine durch die dichte graufilzige Behaarung der Stengel und Blätter und namentlich durch die wenig fleischige Beschaffenheit dieser letzteren, sowie ihre oval-spitze Gestalt sehr ausgeprägte Spielart, die, wie es scheint, keineswegs auf das innere Wüstengebiet beschränkt ist, da man ähnliche Formen auch im Littoral von Oran und in West Algerien aufgefunden hat.

[Wir fanden die schöne Pflanze in dichten Büschen bei Ghardaia und an den Oued-Mya und seine Zuflüsse begrenzenden Felsenwänden südlich bis Ain Guettara. Die Blüten haben einen prachtvollen Duft. Bei Ghardaia viel umflogen von einem seltenen Schmetterling, *Teracolus noua*.—E. H.]

17. *Cleome arabica* L.

Dieses wegen des scharfen Geruchs der es in allen Theilen bedeckenden klebrigen Drüsen von den Weidetieren gemiedene Kraut ist durch das Saharagebiet von Algerien und Tunesien ostwärts bis nach dem peträischen Arabien verbreitet und tritt, wo vorhanden, stets in grosser Menge auf. An den Drüsen findet man nicht nur Sandkörner haften, sondern gewöhnlich auch zahlreiche kleine Insekten. Die Art kann in die Kategorie der Sandpflanzen, wenn auch nicht der ausschliesslichen gestellt werden.

[Sehr häufig im Gebiet des südlichsten (oberen) Oued-Mya.—E. H.]

## CRUCIFERAE.

18. *Diplotaxis siifolia* Kz.

[Wir fanden diese seltene Art nur etwa 30 km. nördlich von El-Golea auf felsigem Boden mit viel angewehstem Sande.—E. H.]

19. *Farsetia aegyptiaca* Turra.

[Im oberen Oued Mya und Oued Nça erbeutet.—E. H.]

20. *Henophytum deserti* Coss. Dur.

Ein 1 Meter hoher sparriger aber dornloser Strauch mit elfenbeinweissen, glänzenden Zweigen, etwas fleischigen, linearischen Blättern und violetten Blüten, der für den mittleren Teil des Saharagebiets, von der Mzab-Gegend bis Fezzan als Charakterpflanze dienen kann, da er weder in den östlichen noch in den von der Mzab-Gegend westlich gelegenen Wüsten aufgefunden wurde. Die Pflanze wächst vorzugsweise im tonig-kalkigem Grunde der Talsohlen, dann auch auf gypsigen Sandboden.

[In grosser Menge im Tale südlich von "El-Meksa," im Erg-bent-Chaouli (südlich von El-Golea), ausserdem nur in der Mzab-Gegend südlich von Ghardaïa beobachtet. Bei El-Meksa flog eine grosse Diptere an den Blüten.—E. H.]

21. *Malcomia aegyptiaca* Spr.

[Am Safet-Iniquel nördlich von El-Golea und in der Mzab-Gegend, etwa halbwegs zwischen El-Golea und Ghardaïa, auf felsigem Boden, eingesammelt.—E. H.]

22. *Mathiola livida* D.C.

Eine kurzlebige, echte Sandpflanze, die nach Regenfall schnell sich entwickelt und oft kaum zwanzig Tage ihrer Vegetationsdauer zählt. Sie ist durch die Sahara von Marokko an bis nach Syrien verbreitet. Die Blütenfarbe wechselt an derselben Stelle in auffallender Weise und ist bald ein schmutziges gelb oder rosa, bald ein reines weiss, gelb oder rosa.

[Nur am 3. April im Oued-Saret, einem sandigen Flussbett inmitten felsiger Hammada gefunden.—E. H.]

23. *Morettia canescens* B.

[Am 3. April im Oued-Saret und späterhin im selben Monat im Gebiete des südlichen Oued-Mya gesammelt.—E. H.]

24. *Moricandia arvensis* D.C.

Die im mediterranen Südeuropa und im Küstenlande von Klein-Afrika ebenso wie in den Oasen der Sahara heimische schönblütige Pflanze bildet zahlreiche Spielarten. Im Saharagebiet erscheint sie besonders als Feldunkraut (z. B. bei Biskra) unter Getreide, aber auch in der freien Natur auf steinigem Terrain der Talsohlen. Die var. *nitens* Viv., die hauptsächlich in der algerischen Sahara sehr häufig ist, findet ihre Ostgrenze nahe vor Alexandria bei Mariut, wo sie noch in grosser Menge angetroffen wird.

Sie ist mit ihren grossen rosenroten Blüten eine der schönsten Pflanzen der Flora. Die Araber der Ziban bezeichnen sie stets merkwürdigerweise mit dem Namen "Krumb," der eigentlich nur für den Kopfkohl Geltung hat.

[In Menge an den Rändern des stüllichen Oued-Mya, südlich bis zum äussersten Abhange des Plateau von Tademaït, bei Safet-Iniquel und in der Mzab-Gegend beobachtet und gesammelt.—E. H.]

25. *Savignia longistyla* Boiss. Reut.

Eine unscheinbare, typische Flugsandpflanze, die oft in winzigen Formen auftretend unter den Vertretern der kurzlebigen Sandflora ihr ephemeres Wesen wohl am meisten bekundet. Sie ist im nördlichen Teil der algerischen Sahara, bei Biskra, im Mzab, bei Laghouat wiederholt eingesammelt worden, und gewiss auch in den westlichen Gebieten verbreitet. In den tripolitanischen, aegyptischen und persischen Wüsten wird sie durch die ihr äusserst ähnliche *S. parviflora* Webb. ersetzt.

[Zwischen Ouargla und El-Golea gesammelt.—E. H.]

26. *Zilla macroptera* Coss. Dur.

Diese durch ihre breitgeflügelten Kapseln sehr auffällig gekennzeichnete, im übrigen aber der *Z. spinosa* Prantl (= *Z. myagroides* E.) sehr ähnliche Art tritt im westlichen Teil des Saharagebiets, nachweisbar von Sokna und Fezzan an bis zum Süd-Oran an die Stelle der letztgenannten, die in den aegyptischen Wüstentälern überall ihr Massenvorkommen hat, die sich auch noch in Palaestina und Syrien vorfindet. Die Pflanze ist von zweijähriger Dauer und bildet sehr grosse meist über 1 Meter Höhe erreichende, unzählige verzweigte Dornbüsche, die mehr oder minder die Kugelform anstreben.

[Nur etwa 30 km. nördlich von El-Golea gefunden.—E. H.]

**RESEDACEAE.**27. *Reseda papillosa* Müll. Arg.

Die Art ist auf den östlichen Teil von Klein-Afrika beschränkt, und scheint weder im Westen von Constantine nach im Osten von Tunesien vorzukommen.

[Diese seltene Resedaform wurde am 1. Mai im Bette des südlichsten Oued Mya gefunden, wo viele Pflanzen der Art standen.—E. H.]

**LEGUMINOSAE.**28. *Anthyllis Henoniana* Coss.

Diese Art gehört der inneren Sahara-Region an und fehlt in der nördlichen Randzone. Im Oasengebiet des Mzab ist sie wiederholt aufgefunden worden.

[Im Süden von El-Golea.—E. H.]

29. **Caesalpinia Gilliesii** Wall.

[Diese Südamerika entstammende Pflanze wurde in den Offiziersgärten in El-Golea und In-Salah wohl gedeihend angetroffen.—E. H.]

30. **Crotalaria Saharæ** Coss.

Diese in der Gegend von Ghadames von Duveyrier im Jahre 1860 entdeckte Art ist die einzige der in den Tropenländern und besonders in denen von Afrika so artenreichen Gattung, die aus der Sahara bekannt wurde. Sie wurde auch bei Ain-el-Hadjadj zwischen Ouargla und Rhat und auf dem Plateau der Hamada-Tinghart gefunden. Abbé Chevallier sagt, dass die Pflanze in der ganzen Region von Tadmaït verbreitet, aber nirgends häufiger sei als im Oued-Saret, wo sie Dr. Hartert auch sammelte.

Im Oued-Mya soll sie bis zum Oued-Safsaf (30 n. Br.) hinunter vorkommen. Man wird annehmen können, dass sie nordwärts im allgemeinen den 30° n. Br. nicht überschreitet.

Die nächstverwandte Art ist offenbar die in den Wüsten und Halbwüsten von Süd-Nubien bis nach Kordofan und auch in Süd-Arabien und in Yemen verbreitete *Crotalaria lupinoides* H., die in allen Teilen grössere Verhältnisse aufweist, auch nie die feine weissfilzige Behaarung der Blätter zeigt wie die Sahara-Art, die häufig 4–5 Blättchen entwickelt, während die andere stets nur dreizählige Blätter aufweist.

[In ziemlicher Anzahl im Oued-Saret, am 3. April, gefunden. Vergl. Duveyrier, *Les Touareg du Nord*, und *Bull. Soc. Bot. France* xi. 1864, p. 165, Taf. 4.—E. H.]

31. **Lotus Jolyi** Batt.

Die Art, die dem *L. creticus* L., nahe steht, sich von ihm aber durch die längeren und bis zu 40 Samen enthaltenden Hülsen, dann durch weit grössere Blüten, vor allem durch längere Kelchzipfel unterscheidet, wurde nach Exemplaren, die Flamand und Joly im Oued-Tilemssi, im Oued-Arreyed und im Oued-Inssoki, einem Zufluss des Oued-Mya in Dezember 1899 einsammelten, ungenügend beschrieben, da keine reifen Hülsen vorlagen.

Abbé Chevallier sagt, sie sei eine der häufigsten Pflanzen des Plateaus von Tadmaït und gegen El-Golea hin bis nach Sahab-es-Ser verbreitet.

Die in ihrem Reifezustande bisher unbekannt gebliebene 4, 5 Cm. lange, geradegestreckte Hülse ist stielrund, hell und fast weisslich von Farbe, völlig kahl und mit einem in die Länge gezogenen Maschenwerk von vertieften Nerven bedeckt.

[Oued-Saret, April 3.—E. H.]

32. **Psoralea plicata** D.

Ein kleiner Halbstrauch der in Aegypten zu den wenigen Arten zählt, die zugleich in den Wüstentälern und auf dem schwarzen Alluvialboden der Niltals vorkommen. Die Art ist übrigens im tropischen Afrika von grosser Verbreitung.

[Die hier seltene Art wurde im südlichen Oued-Mya gesammelt.—E. H.]

33. **Retama Raetam** Webb.

Eine für die Wüsten-region der alten Welt bis nach Syrien typische Stranchart. Die ginsterartig vielästigen, aber dornlosen und weichen Triebe werden weder von Kamelen noch von anderen Wiederkäuern gefressen.



Die Blüten haben einen angenehmen Geruch, der an den der Blüten des Pfeifenstrauches (*Philadelphus*) erinnert.

[Überall häufig im Flugsandgebiete, mitunter bis zu zwei, ausnahmsweise auch 3 M. Höhe. Im Oued Mya Gebiet fressen die dortigen Hasen die jungen Triebe. Ich brachte Proben vom südlichsten Oued-Mya und Samen von El-Arich mit. In dem "El-Arich" genannten Flugsandgebiete zwischen Touggourt und Guerrara leben hieran in Menge die Raupen einer Psychide der Gattung *Amicta*, vermutlich *Amicta murina mauretunica*, von W. Rothschild von Bou-Saada beschrieben. Die Säcke bestehen dort ganz aus Retam-Stengeln.—E. H.]

#### GERANIACEAE.

##### 34. *Erodium guttatum* L'Her.

Diese im westlichen Gebiet der grossen Sahara-Region für das auf die Wüsten von Aegypten und Palaestina beschränkte *E. bryoniaefolium* B., vikarierende kleine einjährige Art ist der genannten dem Aussehen nach sehr ähnlich. Sie tritt besonders häufig auf den Hochebenen des Tel-Berglandes von Algerien auf und ist zugleich am Nordrande der Sahara, bei Biskra und in Süd-Tunesien im Gerölle der Talrinnsale überall anzutreffen.

[Wir trafen die Art häufig südlich und nördlich von El-Golea an.—E. H.]

#### ZYGOPHYLLACEAE.

##### 35. *Fagonia Flamandi* Batt.

Diese Art wurde in Dez. 1899 von Flamand und Joly im Oued-Inssoki, einem Zuflussstal des Oued-Mya aufgefunden und stellt eine in der inneren Sahara-Region von der weit verbreiteten *F. cretica* L., abgeleitete Modifikation dar. Tracht und Aussehen erinnern an die letztgenannte Art, aber die vorliegende ist völlig kahl. Die Blätter fallen frühzeitig ab und die langschüssigen, sandfarbigen Aeste starren dürr mit den unzähligen stehengebliebenen Stipulardornen ihrer Internodien in die Höhe. Die hellkirschroten Blüten sollen nach Joly wahrriechend sein, was bei den meisten Arten der Gattung nicht der Fall zu sein scheint. Abbé Chevallier sammelte 1904 diese Art gleichfalls bei Ain-Guettara.

[Nördlich von Ain-Guettara, auf dem Plateau von Tademaït und 30 km. nördlich von El-Golea am 22. März gesammelt.—E. H.]

##### 36. *Fagonia fruticans* Coss.

Dieses durch seine langschüssigen starkverholzten und in ginsterartiger Besenform emporstrebenden, mit schmierigklebrigen rostbraunen, Drüsenhaaren besetzten Aeste (voller anklebender Sandkörner) weithin kenntliche Strauchwerk muss einen sehr eigentümlichen Anblick gewähren. Abbé Chevallier schildert es als ein Gewächs der Felsen und der "Nebkas." Die Zweige sind immer sehr blütenreich und man bedient sich, wie Joly angibt, der Blüten zum Gerinnenmachen der Milch. Nach Chevallier ist auch ihnen ein Wohlgeruch eigen, der an Rosenluft erinnern soll. Der Verbreitungsbezirk dieser Art schliesst die nördlichste Sahara-Region aus und bleibt im Süden auf ihren algerisch-tunesischen Anteil beschränkt.

[Wurde am Safet Iniquel, nördlich von El-Golea am 23. März und späterhin südlich von El-Golea gesammelt.—E. H.]

37. *Fagonia Bruguieri* D.C.

In den östlichen Gebieten der grossen Wüstenreihe, die sich von Aegypten bis Persien und Afghanistan erstreckt, ist diese Art die allverbreitete, die in keinem Talrinsal fehlen dürfte; innerhalb der westlichen dagegen ist sie bisher nur in der algerischen und tripolitanischen Sahara aufgefunden worden.

[Südlich von El-Golea.—E. H.]

38. *Nitraria tridentata* Desf.

Überall, wo dünenartige Sandverwehungen stattfinden, ist dieses vielverästelte dornige Strauchwerk als Halt und Stütze der sich bildenden Hügel anzutreffen, weitverbreitet im Gesamtbereich der nördlichen Wüstenregion der alten Welt, von Marokko bis noch Nordwestindien. Die oft sehr ausgedehnten Hügelgebüsche dienen zahlreichen Geschöpfen der Wüste als Schutz und Unterschlupf. Die in Dornen auslaufenden Zweigspitzen werden ab und zu, wie die des *Lycium*, von Würgern zum Aufspieszen ihrer Beute an Insekten benutzt. Ich habe bei Biskra in *Nitraria*-Gebüschen ausser Raupen, Käfern und Libellen, sogar kleine Eidechsen (*Acanthodactylus*) aufgespiesst gefunden, die gleichfalls zu den Vorräten der Würger gehörten.

[Es scheint mir, dass dieser Busch nicht weit nach Süden reicht, denn ausser bei Biskra und in der Mزاب-Gegend fand ich ihn nur im Tal des Hassi-Okseibat, etwa 26 km. südlich von El-Golea, wo der Wüstensperling, *Passer simplex saharae* darin sein Nest hatte.—E. H.]

39. *Peganum Harmala* L.

Der "Harmal" gehört zu den wenigen perennen Kräutern, die dem Mittelmeergebiet und der grossen Wüste zugleich angehören. Von Marokko bis nach Nordwestindien ist die durch ihre grossen weissen Blüten und das grüne und blattreiche Aussehen ihrer Triebe bemerkenswerte Pflanze allverbreitet und gewiss ist sie für das Leben der Insektenwelt in den Wüsten von Bedeutung, wegen ihres dauerhaften Grünbleibens.

[Ich kann mich nicht erinnern, diese Pflanze südlich des Mزاب-Gebietes gesehen zu haben. Ich sammelte sie zwischen Ghardaïa und Touggourt.—E. H.]

40. *Zygophyllum cornutum* Coss.

Im frischen Zustande hat die Pflanze ein von dem verwandten *Z. album* L., gänzlich verschiedenes Aussehen und unterscheidet sich von diesem hauptsächlich durch die grösseren, zartrosa gefärbten Blüten. Sie ist mehr noch als die letztgenannte Art eine ausgesprochene Pflanze der Sandhügel, steigt aber auch bis hart an die mit Salz inkrustierten Tonablagerungen hinab, die der Schottregion von Algerien und Tunesien eigen sind und zugleich den inneren Verbreitungsbezirk der Art im Saharagebiet kennzeichnen.

Die über das Ende der Kapsel in Gestalt von 5 Hörchen vorspringenden Kanten, die den Artnamen veranlassten, finden sich gleichfalls bei einer Form des *Z. album* L. die im aegyptischen Küstenlande des Mittelmeers auftritt. Die letztgenannte Art, die von Algerien bis Syrien durch die nördlichen Wüstengebiete weitverbreitet ist, kann aber in jedem Falle von der vorliegenden durch eine Reihe von sicheren Merkmalen unterschieden werden.

[Am Hassi Okseibat, südlich von El-Golea, am 12. Mai gesammelt.—E. H.]

**RUTACEAE.**41. *Haplophyllum tuberculatum* Forsk.

Diese wahrscheinlich durch das starke Arom ihrer Drüsen das Insektenleben der Wüste beeinflussende Art ist durch die gesammte Sahara-Region von Marokko bis Persien verbreitet und ihr Vorkommen erstreckt sich auch südwärts weit in die Gebiete der Halbwüsten und der Steppen hinein, bis nach Abessinien und Süd Arabien.

[Die unangenehm riechende Pflanze wuchs massenhaft an den Rändern der Flussbetten des südlichen Oued Mya Gebietes.—E. H.]

**EUPHORBIACEAE.**42. *Euphorbia cornuta* Pers.

Diese Art ist dem steinigem Wüstengelände mit Kiesgerölle und Geschieben eigen und erscheint in den Rinnalen der Wüstentäler, wo Tonanschwemmungen das aufgehäufte Trümmergestein bedecken. Sie ist durch das ganze nördliche Saharagebiet von Marokko bis nach Aegypten verbreitet und auch in der östlichen Wüste Aegyptens und im Peträischen Arabien sehr häufig anzutreffen. Die arabischen Beduinen bezeichnen sie durch eigene Namen und sie gilt als Gift, dem das Kleinvieh erliegt, wenn es davon weidet.

[Am 1. Mai in ziemlicher Menge im südlichsten Oued-Mya-Gebiet gefunden.—E. H.]

43. *Euphorbia Guyoniana* Boiss. R.

Eine echte sandverwehte Dünenpflanze der mittleren westlichen Sahara-Region, innerhalb des französischen und tripolitaniischen Gebietes. Mit ihren langschüssigen Wurzeln dringt sie tief bis in die wasserführenden Schichten ein und verbreitet sich, wie alle Euphorbien, durch leichte Aussaat während der Winterregen.

[Massenhaft in den Flugsandgebieten zwischen Biskra und Touggourt und bei Laghouat. In grosser Menge im Sandgebiet zwischen Touggourt und Ghardaïa, und im Tale des Hassi-Okseibat südlich von El-Golea; weiter südlich nicht bemerkt. Futterpflanze der Raupen von *Celerio euphorbiae deserticola*.—E. H.]

**RHAMNACEAE.**44. *Zizyphus Lotus* L.

Dieser niedere Dornstranch beteiligt sich, wo Flugsand in Betrieb ist, am Aufbau der selbstveranlassten Dünenhügel, die er mit seinen unentwirrbar verzweigten, oft den Sand kaum handbreit überragenden Dorngehegen überzieht. Das in der Tiefe mächtig ausgebreitete, langschüssige Wurzelwerk soll sehr schwer auszurotten sein. Zahlreiche Insektenarten befestigen ihr Eierhüllen an den dornbewehrten Zweigen, in deren Schutze andere wiederum ihre sicheren Lebensstätten finden. Diese Art ist auch im südlichen Mediterrangebiet vorhanden und von Spanien aus über die nordafrikanische Wüstenregion und von Marokko bis zur Marmarika verbreitet. Innerhalb der aegyptischen Wüsten ist sie noch nicht aufgefunden worden.

[Überall in Flussbetten und anderen Depressionen, von Biskra bis in das Tal des Oued el-Abiod zwischen Ain Guettara und In-Salah, also südlich des Plateau von Tademaït. Vorzüglichste Brutstätte von *Lanius excubitor elegans* und *Crateropus fulvus*. Ende Mai und Juni wimmelte es von Insekten—wenn auch nur wenigen Arten—an den gelben Blüten.—E. H.]

**TAMARISCACEAE.**45. *Tamarix articulata* Vahl.

Oft in Gestalt grosser Bäume auftretend ist diese Art die weitverbreiteste der Gattung. Durch das Gesamtgebiet der Sahara und weiter ostwärts durch Arabien und Persien bis nach Nordwestindien erstreckt sich ihr Vorkommen.

[Es scheint mir, dass die riesigen Tamarisken, oft mit meterdicken Stämmen, im südlichen Oued-Mya-Gebiet zu dieser Art gehören müssen, während in der nördlichen Sahara meist kleinwüchsige Arten angetroffen werden. Nur bei Laghouat sah ich 1911 Tamarisken in solcher Grösse, doch wurden keine Proben gesammelt.—E. H.]

46. *Tamarix pauciovulata* I. Gay.

Nah verwandt mit der in den ägyptischen Wüsten einheimischen *T. passerinoides* Del. unterscheidet sich diese auf die Wüstengebiete von Tunesien und Algerien beschränkte Art von ihr hauptsächlich durch die grösseren und minder zahlreichen Samen, die in den Kapselälchern enthalten sind.

[Diese und die vorige Art wurde gesammelt in der "Daia-bn-Ziane" genannten Depression, einem Talkessel mit eigenartigem Gipsande, mitten zwischen Sanddünen und zu Tage tretendem glatten Felsgestein. Sie bildet hohe Büsche und ich kann mich nicht erinnern, sie anderswo genau so gesehen zu haben, indessen habe ich leider versäumt, an anderen Plätzen Tamariskenproben zu sammeln.—E. H.]

**CISTACEAE.**47. *Helianthemum sessiliflorum* Pers.

Unter den zahlreichen Arten dieser Gattung, die die Küstenländer von Nordafrika beherbergen, bleibt die vorliegende auf die Täler und Riunsale des algerisch-tunesischen Saharagebiets beschränkt, wo sie Kalkfels und Gerölle bevorzugt. Sie hat keinen Wert als Futterpflanze.

[Wir fanden diese schön gelbblühende Art in Menge in den Depressionen mit Kalkfelsengrund zwischen den Dünen des Erg-bent-Chaouli südlich von El-Golea, am Hassi Okseibat etwas weiter nördlich und zwischen El-Golea und Ghardaia, wo sie noch am 22. und 23. Mai blühte. Vermutlich ist die von Koenig als *Helianthemum hirtum* bezeichnete Art des Mزاب-Gebietes eine Form von *sessiliflorum* gewesen.—E. H.]

**THYMELAEACEAE.**48. *Thymelaea microphylla* Coss. Dur.

Diese durch das ganze westliche Saharagebiet von Marokko bis nach Tripoli verbreitete Art vertritt im Süden die auf die Mittelmeerländer und die anstossenden Wüsten von Nordafrika beschränkte *T. hirsuta* Endl. Letztere dringt indess in den algerisch-tunesischen Teil ihres Verbreitungsgebietes erheblich weit nach Süden vor. Beide Arten beherbergen unter dem Schutze der täuschenden Ähnlichkeit ausser den Chamaceleonen auch verschiedenartige Insekten. Das auffälligste unter diesen ist die weissgrünesprenkelte, im Larvenzustande nur sehr schwer in den Thymelaeabüscheln auffindig zu machende Mantide, *Blepharopsis mendica* (Fabr.), die bei den Bewohnern der Ziban-Oasen den phantastischen Namen Naqa-Djeddi ("die Kamelstute meiner Grossmutter") führt, und von der Dr. Walter von Rothschild in Biskra in allen Stadien ihrer Entwicklung Exemplare eingesammelt hat. Aus den feinen

stecknadelstarken, filzigen zweigen dieser Thymeleen zimmert die *Amicta murina mauritanica* bei Biskra gern ihre eigentümlichen vierkantigen und wohlgefügtten "Mottensäcke," die dort unter dem Schutze des dichten Dorngehages von Zizyphus Lotus mit Vorliebe an die Zweige dieses niederen Wüstengestrüpps angehängt werden.

[Diese in der nördlichen Sahara, z. B. bei Biskra und südlich bis nahe Touggourt sehr häufige Pflanze wurde noch am Safet Iniquel nördlich von El-Golea eingesammelt.—E. H.]

#### UMBELLIFERAE.

##### 49. *Ammodaucus leucotrichus* Coss.-Dur.

Eine im Flugsande der Sahara-Region von Marokko bis zum nördlichen Teil der Libyschen Wüste verbreitete Pflanze, die besonders im Mzab-Gebiete, bei Ouargla und auch noch bei Biskra häufig angetroffen wird. Nach Cosson und Palat soll die Frucht auf den Märkten der Oasen als Speise feilgeboten werden. Wahrscheinlich dient sie als Küchengewürz.

[Beim Safet Iniquel nördlich von El-Golea und im Mzab-Gebiete angetroffen.—E. H.]

##### 50. *Daucus pubescens* Koch.

[Im Oued Saret häufig.—E. H.]

##### 51. *Deverra (Pithyranthus) scoparia* Coss.

In den Sahara-Gebieten von Algerien, Tunesien und Tripolitanien ersetzt diese Art die weiter im Osten mehr allgemein verbreitete *D. tortuosa* DC. Sie gleicht im Habitus mit ihren hoch aufgeschossenen wenigverzweigten Aesten der in den östlichen Felswüsten von Aegypten und auch im peträischen Arabien und in Syrien einheimischen *D. triradiata* H. Alle *Deverra*-Arten sind durch einen sehr starken, nicht unangenehmen Petersiliengeruch ausgezeichnet. Ueberall bezeichnen die arabischen Wüstenbewohner diese Pflanzen mit dem selben Namen "qesüch" oder "qussäh." Es sind Felspflanzen und bevorzugen in den Tälern die steinigten von Kieselsteinen und Gerölle erfüllten Rinnsale. Von der vorliegenden *Deverra* berichten die Bewohner der Ziban-Oasen, dass Kamele, wenn sie davon gefressen haben, erblinden. Dem entgegen haben mir die in der östlichen Wüste von Aegypten nomadisierenden Beduinen die ähnliche *Deverra triradiata* H. als ein vortreffliches Kamelfutter gepriesen.

[Eine der häufigsten und auffallendsten Pflanzen der Talsohlen und Oueds, besonders zwischen Ghardaia und El-Golea, auch beim Safet Iniquel und noch massenhaft im Oued Saret, nördlich vom Fort Miribel. Hat einen starken, halb fenchel-halb petersilienartigen Geruch und wird von den Kamelen ohne Schaden gefressen. Hieran leben die Raupen von *Papilio machaon hospitonides*, der Wüstenform unseres Schwalbenschwanzes.—E. H.]

#### PLUMBAGINACEAE.

##### 52. *Limoniastrum Guyonianum* Coss.-Dur.

Die durch die Menge ihrer prachtvollen rosa Blüten so kenntliche "Seta" gehört zu der Kategorie derjenigen Pflanzen, die, wo Flugsand sich bewegt, Hügel aufbauen, die sie dann mit ihren unablässig vorgestreckten Trieben wie mit dichten Polstern bekleiden, bis sie selbst nach Jahren vom Sande überflutet absterben und an die Stelle dieser ihrer Wandergräber zu neuen Gebilden Veranlassung geben

(*Tamarix*, *Nitraria*, *Salsola*, etc.). Diese Art ist auf die algerische und tunesische Sahara beschränkt und sie ist bis an deren Nordrand in grosser Häufigkeit anzutreffen. An vielen Orten treten an den Zweigen dieser Art eigentümliche elliptisch-ovoide Verdickungen auf, die von der gleichen grau- oder blaugrünen Farbe wie die Blätter erscheinen und die Grösse kleiner Pflaumen erreichen. Diese Gallenanschwellungen sind meist an der Spitze der jungen Aeste angelegt (beim Eierlegen von einem Kleinschmetterling, *Oecocercis guyonella*). Innen sind die Axengebilde hohl und von derselben Farbe wie aussen. Eine vorhandene Zwischenschicht des Parenchyms ist indess purpurfarbig. Der Körper verholzt später so stark, dass man Mühe hat, den Hohlraum aufzuschneiden. Innen findet sich alsdann eine 15 gliedrige, 15 Millm. lange Puppe, oder eine Raupe. An dem Hohlkörper findet sich stets ein klappenartig für den Austritt des Schmetterlings angelegtes Loch. Oft dringt ein fremdes Insekt durch diese Oeffnung ein und verzehrt die Puppe, vielleicht auch dringen andere von Aussen absichtlich durch eigene Arbeit ein. The Hon. Walter Rothschild, als ich den Vorzug genoss mit ihm in Biskra zusammen zu treffen, machte mich auf etwaige Analogieen aufmerksam, die vielleicht zwischen diesem Vorkommen und dem biologischen Verhalten der Larven der *Carpocarpa saltitans* ("jumping bean" von Neu-Mexico) bestehen könnten.

[In den Sandgebieten der nördlichen Sahara von Biskra bis Touggourt un-  
gemein häufig und eine der Hauptzierden mancher Strecken, die auch hart an die  
öden Schottgebiete hinaureicht, soweit der Boden sandig ist. In grösster Üppig-  
keit südlich von El-Golea, am Rande des grossen westlichen Erg, und beim Hassi  
Marroket, 50 km. südlich El Golea bis 3 m. hoch werdend! Südlich davon nicht  
beobachtet, soviel wir uns erinnern können.]

Die Gallen des Kleinschmetterlings *Oecocercis guyonella* waren unglaublich  
häufig in den Flugsandstrecken zwischen Bledet-Ahmar (südöstlich von Touggourt)  
und El-Alia. In allen verlassenem (ausgekrochenen) "Gallen" lebte eine Spinne,  
denen die geschützten harten Kugeln einen willkommenen Aufenthalts- und Brut-  
platz gewährten. Ausser der *Oecocercis* soll noch eine andre, von Chretien beschrie-  
bene Lepidoptere in diesen Gallen ihre Entwicklung durchmachen.—E. H.]

### 53. *Limoniastrum Feei* de Gir.

Weit grössere roseurote Blüten, als sie die andere Art dieser Gattung besitzt,  
kennzeichnen die vorliegende. Sie ist gleichfalls auf das Gebiet der französischen  
Sahara beschränkt, erweist sich aber mehr als Felsenpflanze, die mit Vorliebe auf  
festem Kalkgrund und Gerölle wurzelt. Die schöne Pflanze erreicht nicht in so  
hohem Grade die Häufigkeit der Masspflanze wie die kleinblütige Art.

[Nur bei El-Hadadra, im Tale inmitten der grossen Hammada, in der Mitte  
zwischen El-Golea und Ghardaïa, gesammelt, aber vielleicht an anderen Orten mit  
der gemeineren Art verwechselt.—E. H.]

### 54. *Statice Bonduelli* Lestib.

Unter den 26 Arten dieser Gattung, die Kleinafrika beherbergt, ist die  
vorliegende durch die prachtvoll zitronengelbe Färbung ihrer Perigone ausgezeichnet.  
Sie ist in der Sahara-Region der drei algerischen Provinzen zu Hause und ausserdem  
in Süd-Marokko und in Süd-Tripolitanien verbreitet.

[In den Oneds zwischen Ghardaïa und El-Golea, besonders um den Hassi  
Zirara herum, in Menge vorhanden und eine hervorragende Zierde.—E. H.]

**ASCLEPIADACEAE.**

55. *Daemia cordata* R. Br.

Diese Art bevorzugt Felsboden oder Tonablagerungen, die solchen zur Grundlage haben. Sie ist als ein Charaktergewächs der grossen Wüstenregion zu bezeichnen, die man das "Reich der Dattelpalme" nennen könnte, von Marokko bis nach Nordwestindien. Die mit einem süsslichen Milchsaft erfüllten Stengel und Fruchtkapseln dürften manchen Arten des Hühnergeschlechts unter Umständen als erwünschte Speise dienen, da man sich in Zentralafrika ähnlicher von verwandten Arten als Köder beim Fallenstellen bedient.

[In Oueds und an Felsenhängen hier und da von Ghardaïa bis zum Fort Miribel; rankend und oft grosse Büsche bildend.—E. H.]

56. *Periploca laevigata* Ait.

Eine von den wenigen Arten, die das innere Sahara-Gebiet mit den regenreichen Gegenden der nordafrikanischen Küstenzone gemein hat. Von Marokko, Spanien und Sizilien ist sie durch das ganze Littoral von Nordafrika über Algerien und Tunesien nach Marmarica und weiter bis nach Unteraegypten und Syrien verbreitet. Auch nach Süden zu dringt sie tief in das Sahara-Gebiet ein.

[Diese merkwürdige Pflanze wurde häufig in geschützten Flussbetten zwischen Ghardaïa und El-Golea gefunden. Die Fruchtschoten sind in der Jugend an den Spitzen zusammengewachsen, später sich öffnend. Äusserst dichte Büsche bildend.—E. H.]

**CONVOLVULACEAE.**

57. *Convolvulus supinus* Coss. Kral., var. *leucotrichus* Kral.

Diese Spielart der durch ganz Kleinafrika auf Sandfeldern verbreiteten Pflanze ist durch die weisse, seidenweiche, fast flaumartige Behaarung der auf den Boden ausgebreiteten Stengel und Blätter ausgezeichnet. Sie gehört dem inneren Gebiet der Sahara an und ihr Verbreitungsbezirk umfasst die ganze westliche Hälfte dieser Region. Die Oase Sokna in Tripolitanien scheint die östliche Verbreitungsgrenze der Art zu bezeichnen.

[Wir fanden sie zuerst etwa halbwegs zwischen Onargla und El-Golea, südlich bis zum Oued Saret.—E. H.]

**BORAGINACEAE.**

58. *Arnebia decumbens* Coss.

[Häufig in der Mitte zwischen El-Golea und Ghardaïa, besonders um den 23. Mai.—E. H.]

59. *Echium humile* Desf.

Eine durch ihre grossen dunkelblauen Blüten viele Insekten anlockende stattliche Pflanze, vielleicht die farbenprächtigste der Wüstenregion. Diese Art ist hauptsächlich an harten Kalkfels gebunden und in allen Wüsten von Algerien und Tunesien anzutreffen. In den weiter östlich gelegenen Teilen des Sahara-Gebiets ist sie bisher nach nicht aufgefunden worden.

[Zwischen Onargla und El-Golea und im Bette des Oued Saret am 3. April blühend.—E. H.]

60. *Heliotropium undulatum* Vahl.

[Oued Saret, 3. April.—E. H.]

61. *Lithospermum callosum* Vahl.

Tiefwurzelnd in den Flugsandgebilden, die auf Kalkfelsen haften, aber gewöhnlich diese meidend, ist die durch ihren reichen roten und violetten Blütenschmuck ausgezeichnete Pflanze durch das ganze Wüstengebiet von Nordafrika bis nach Syrien verbreitet. Sie lockt mannichfaltige Insekten an.

[Südlich von Onargla, am Safet-Iniquel nördlich von El-Golea und beim Hassi Okseibat südlich von letzterer Oase angetroffen.—E. H.]

62. *Trichodesma africanum* R. Br.

Die durch das ganze Wüstengebiet der alten Welt, von Marocco bis nach Syrien, Persien, und Nordwest-Indien verbreitete vom weidenden Kleinvieh und von den Kamelen als Futterpflanze sehr begehrte Art fehlt in den nördlichen Teilen der algerischen Sahara, wird aber unter 30° n. Br. stellenweise in grossen Mengen angetroffen. Abbé Chevallier betrachtet sie als besonders gemein zwischen El-Golea und Ghardaïa. Die Pflanze ist sehr saftreich und entwickelt denselben gurkenartigen Geruch wie unser Borasch (*Borago officinalis* L.).

[Zwischen El-Golea und Ghardaïa sowie im südlichen Oued Mya häufig.—E. H.]

## LABIATAE.

63. *Marrubium deserti* de Noe.

Eine auf die Saharagebiete von Algerien und Tunesien beschränkte Art, die bis an den nördlichsten Rand der Region in grosser Häufigkeit antritt. Von Interesse dürfte es sein zu erwähnen, dass sowohl die algerischen Araber als auch die der Libyschen Wüste zur Bezeichnung von *Marrubium* den griechischen Namen beibehalten haben, den die Römer der Kaiserzeit gegen das altlateinische Wort eingetauscht hatten. Sie nennen die Pflanze "frasijôn" = *Prasium* (*πράσιον*).

[Häufig zwischen Onargla und El-Golea, am Safet-Iniquel, zwischen El-Golea und Ghardaïa, und auch noch südlich von El-Golea.—E. H.]

## SCROPHULARIACEAE.

64. *Linaria fruticosa* Dum.

Eine in den Wüsten-Gebieten von Algerien und Tunesien für die naheverwandte und ihr ausserordentlich ähnlich sehende *L. aegyptiaca* Dum. vikarierende Art. Die letztgenannte ist von den Wüsten der Cyrenaika an östlich durch die Libysche Wüste und durch die aegyptischen Felswüsten bis nach Palaestina hin sehr verbreitet. Die vorliegende algerische Art bildet gleichfalls ein kleines, Polsterballen darstellendes Strauchwerk, unter dessen starkverholzten und unentwirrbar vielverzweigten, z. T. an den abgestorbenen Spitzen spineszierenden Aesten Käfer und andere Insekten der Wüste Schutz finden.

[Zwischen Ouargla und El-Golea und in dem pflanzenreichen Oued Saret am 3. April.—E. H.]

65. *Linaria laxiflora* Df.

[Die seltene Art wurde nur einmal auf dem Wege von Ghardaïa nach Touggourt gesammelt.—E. H.]

## PLANTAGINACEAE.

66. *Plantago ciliata* Df.

[Am 3. April im Oued Saret.—E. H.]



**COMPOSITAE.****67. Mecomischns Geslini** Benth. Hook.( = *Cladanthus Geslini* Coss.-Dur.)( = *Fradina halimifolia* Batt.)

Es liegen von dieser eigenartigen Flugsandpflanze, einer Anthemidee, nur zwei kleine Blüten tragende Zweigspitzen vor. Die elliptischen Blätter sind, wie immer bei dieser Art, an den Zweigenden alternierend, statt gegenständig gestellt. Der dichte, aschgraue Filz, der Stengel und Blätter gleichmässig bedeckt, ist aus Sternhaaren (mit 7 Strahlen) zusammengesetzt, ein bei den Compositen selten auftretendes Merkmal, das die Pflanze innerhalb des Gebiets vor allen übrigen der Klasse kennzeichnet. Die Blütenköpfchen tragen je sechs ovale, am Ende zweispitzige, schneeweisse Randblüten. Die wenigen Schuppen des Hüllkelches sind mit einem häutigen Saum umgehen, der sie an Breite übertrifft. Die Pflanze ist von Geslin bei Laghouat entdeckt worden und dort sammelte sie auch Cosson, und gleichfalls 1856, General Gansauge. Im Sabaragebiet von Süd-Oran fand man sie in den Dünen von Leumbah und bei Ain Sefissifa. Abbé Chevallier hat sie 1899 bei Ain Sefra gefunden. Auf seiner vierten Sahara-Reise sammelte er Exemplare ("dans un terrain de reg.") bei Bordj Om-el-Kelb und hinter Ghardaïa auf dem Wege von nach El-Golea.

[Das seltene Pflänzchen wurde am 3. April im Sande des Oned Saret gefunden.—E. H.]

**68. Artemisia herba alba** Asso.

Bei allen Arabern unter dem Namen "schïch" bekannt ist diese stark aromatische Pflanze ein Haupttypus der Flora der Gesamtregion der Wüste, von Marokko bis nach Persien. Das Kraut wird in allen Ländern der Region auf den Märkten als Schutzmittel gegen Insektenfrass feilgeboten.

[Diese Pflanze ist ungemün massenhaft auf der Hochebene nördlich von Ghardaïa, z. B. bei Berrian und Tilrhempt zu finden, wo sie oft fast ausschliesslich weite Strecken bedeckt. Dies Jahr fanden wir sie besonders östlich von Ghardaïa. Auf den Märkten von Touggourt und Ghardaïa wurden kleine Häufchen feilgeboten, aber fast nie gekauft.—E. H.]

**69. Asteriscus graveolens** Forsk.

Ein kleiner starkverholzender Halbstrauch, der in den Kalkwüsten von Aegypten und der Sinai-Halbinsel zu den hauptsächlichsten Charakterpflanzen gehört. Im westlichen Saharagebiete wurde die Art zuerst von Rebaud im Mzab-Gebiete aufgefunden. Von Marokko und Tunesien ist sie noch nicht angegangen worden, wohl aber in Ghadames und im Hinterlande von Tripolitanien, auch in den trostlosen Wüsteneien südlich von Fezzan.

[Im südlichen Oued-Mya-Gebiete.—E. H.]

**70. Atractylis prolifera** Boiss.

Die durch hellpurpurne Randblüten und rötlich eingesäumte Hüllschuppen ihrer zierlichen Köpfchen ausgezeichnete Pflanze ist von einjähriger Dauer und bildet kleine am Boden ausgebreitete und verzweigte Rosetten. Sie ist bisher nur im Saharagebiet von Algerien, Tunesien und Tripolitanien aufgefunden worden,

und dann, mit Uebergehnng der aegyptischen Wüsten, wieder im peträischen Arabien.

[Zwischen Ghardaïa und Touggourt.—E. H.]

71. *Chlamydomorpha pubescens* Coss. Dur.

[Im Oned Saret nördlich von Fort Miribel.—E. H.]

72. *Francoeuria (Pulicaria) crispa* Coss.

Diese in allen östlichen Wüstengebieten, von Fezzan an gerechnet bis nach Aegypten, Nubien und Abessinien und weiter über Arabien bis nach Nordwest-Indien verbreitete Art ist in der mittleren algerischen Sahara, aber noch nicht innerhalb des marokkanischen und tunesischen Gebiets aufgefunden worden. Aus Senegambien ist sie indes angegeben worden. In den Oasen von Mزاب wurde die Pflanze wiederholt aufgefunden. In Aegypten gehört sie zu den wenigen Arten, die den desertischen Florencharakter auf alle unkultivierten Stellen übertragen, die noch inmitten des Niltals vorhanden sind und die dort auf dem schwarzen Nilton wachsen. Sie gilt als gute Kamelweide, wie alle Pulicarien.

[Ebenfalls im Oned Saret. In der Tat beliebtes Kamelfutter.—E. H.]

73. *Hypochoeris glabra* L.

Eigentlich eine typische Mediterranpflanze von Südeuropa und dem Küstenland von Klein-Afrika, ist sie auch in den Wüstengebieten von Marokko bis Tripolitanien verbreitet, wo sie unter den einjährigen Sandpflanzen häufig anzutreten und von weiterer Verbreitung zu sein scheint.

[Im Bett des Oned Saret, 3. April.—E. H.]

74. *Ifloga spicata* Sz. B.

[Ebenfalls am 3. April im Oned Saret.—E. H.]

75. *Chrysanthemum (Pyrethrum) deserticola* Murbeck.

Diese Art ist von den algerischen Floristen mit dem *Chr. trifurcatum* Desf. verwechselt worden. Sie wächst als einjährige, kurzlebige Pflanze in den kleinen Rinnsalen der westlichen Wüstenregion von Marokko bis Cyrenaica. Die mit dottergelben Randblüten versehenen Blütenköpfe enthalten einen sehr scharfen an *Spilanthes* erinnernden Saft, der auf der Zunge ein heisses Gefühl hervorruft. Die Pflanze enthält in allen Teilen von diesem eigentümlichen Alkaloid (Pyrethrin?).

[Safet-Iuïquel, nördlich von El-Golea.—E. H.]

76. *Rantherium angressum* Coss. Dur.

Ein bisher nur in der algerischen Sahara beobachteter Halbstranch, der vorzugsweise auf festem Kalkfels anzutreffen ist. Die Nordgrenze seiner Verbreitung findet er auf der südlich von Biskra gelegenen "Montagne de sable." Sehr häufig scheint die Art in den Oasen des Mزاب-Gebietes und bei Laghouat, Bou Saada, etc., vorzukommen.

[Wurde am 22. oder 23. Mai bei Zirara und El-Hadadra, einsamen Brunnen mit "Bordjs" etwa halbwegs zwischen Ghardaïa und El-Golea gefunden.—E. H.]

77. *Senecio coronopifolius* Desf.

Diese Art gehört zu den für das gesammte Wüstengebiet vom Senegal bis zum Indus charakteristischen einjährigen Gewächsen, die sandige Strecken bevorzugen; sie ist zugleich eine von den wenigen der Wüstenregion, die zugleich innerhalb des bebauten Landes, im Tel-Bergland und im Littoral von Kleinafrika, so auch im aegyptischen Niltal zu Hause sind.

[Auf Sand- und Tonboden im südlichsten Oued-Mya-Gebiete im April und 1. Mai, sowie 30 km. nördlich von El-Golea gefunden.—E. H.]

78. *Anvillea australis* Chevallier.

Diese durch das Fehlen der Randblüten von *A. radiata* Coss. Dur., dem auffallenden Florentypus der westlichen Sahara verschiedene Art ist bereits 1860 von Duveyrier im Nordosten von Rhadames aufgefunden worden. Chevallier fand sie 1902 zwischen El-Golea und Inifel. Die Stammart kennt man auch aus dem südlichen Hinterlande von Marokko und aus dem äussersten Süden der algerischen Sahara. Abbé Chevallier hat seine Art neuerdings (1905), durcheinander und in Gemeinschaft wachsend mit der *A. radiata* Coss. Dur., zwischen Hadadra und Hassi el-Hadjar aufgefunden. Er vermutet daher, wie es schon E. Durand (*Flora Libycae Prodromus*, pp. 122, 123) getan, dass die scheinbar sehr abweichende *A. australis* doch nur eine Modifikation der weitverbreiteten Saharapflanze darstellen möchte.

[Oued Saret, 3. April.—E. H.]

79. *Zollikoferia (Launea) spinosa* Boiss.

Im Gesamtgebiet der Wüstenreihe von Marokko bis zum peträischen Arabien und Syrien verbreitet, mit Uebergang (soweit es bis jetzt bekannt ist) der tripolitanisch-cyrenaischen (libyschen) Gebiete. Dieser auf Kalkfels angewiesene oft grossen Umfang erreichende Halbstrauch bildet ein nach Art der Zilla dicht verflochtenes Gewirre von feinen, dornigen, milchenden Zweigen. Die Art gilt als vortreffliche Kamelweide. Sie ist auch in den Floren von Spanien und Griechenland angegeben.

[Am 1. Mai im südlichsten Oued-Mya-Gebiete—E. H.]

80. *Zollikoferia glomerata* Boiss.

[Im südlichsten Oued-Mya-Gebiete in Menge und wie die vorige auch nördlich von El-Golea beobachtet. Die jungen, dem Boden anfliegenden Blätter wurden uns als "arabischer Salat" bezeichnet; wir liessen sie sammeln und waschen und fanden in der Tat, dass sie als Salat zurechtgemacht, eine angenehme Zutat zu unsern Mahlzeiten bildeten.—E. H.]

81. *Zollikoferia nudicaulis* Sz. B.

[Im gleichen Gebiete wie die vorigen.—E. H.]

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(Further results of this expedition will follow.)

ORNITHOLOGISCHE ERGEBNISSE DER REISE VON PAUL SPATZ  
IN DIE ALGERISCHE SAHARA IM SOMMER 1912.

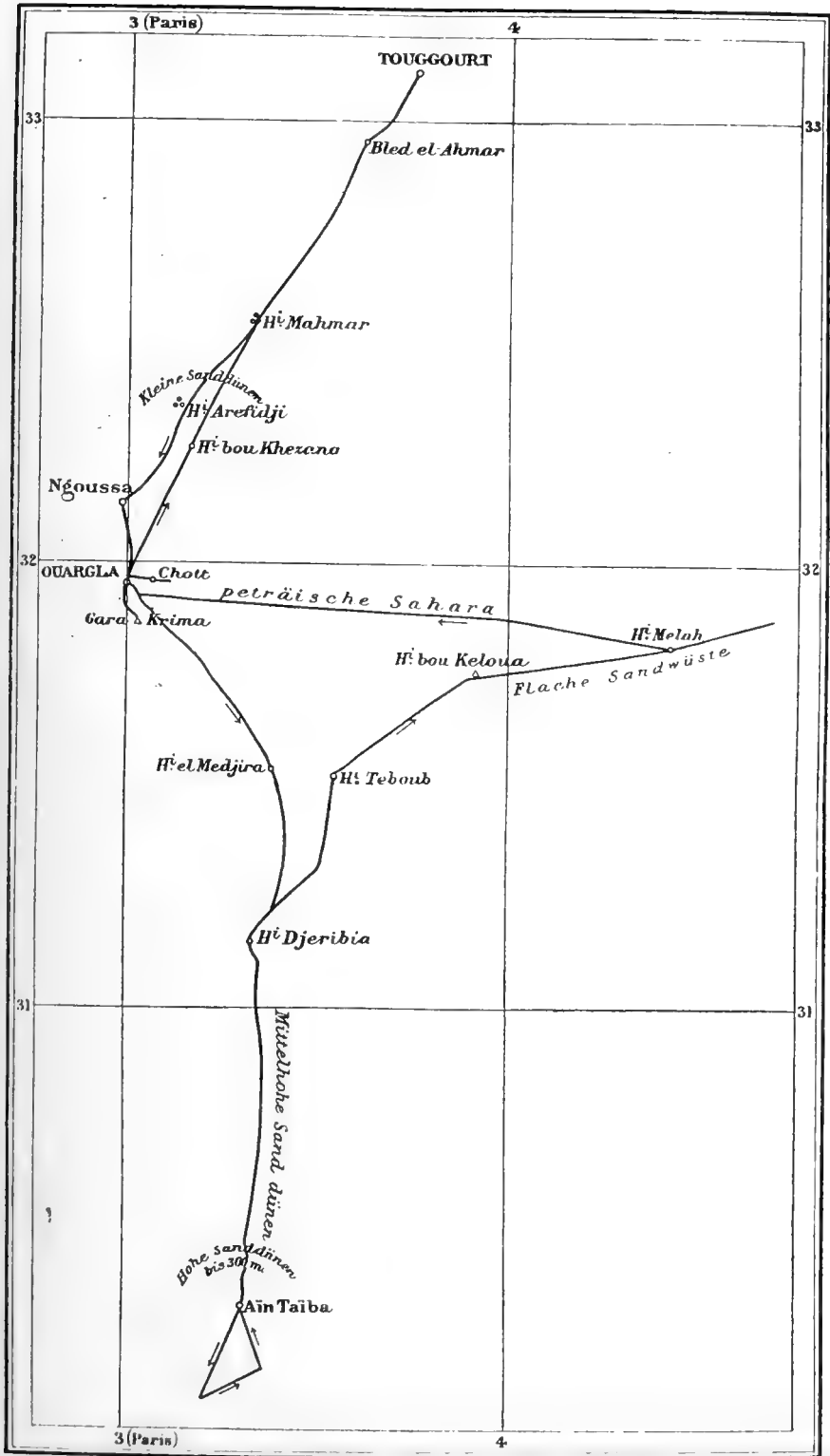
VON O. GRAF ZEDLITZ.

(Mit einer Routenskizze.)

HERR PAUL W. SPATZ, der als eifriger Sammler und wohl einer der besten Kenner der tunesischen Wirbeltier-Fauna in ornithologischen Kreisen allgemein bekannt und gewürdigt sein dürfte, ist vor kurzem von einer zoologischen Erkundungsfahrt aus der algerischen Sahara zurückgekehrt. Indem er für seine Tour die Zeit des Hochsommers wählte, untermog er sich einer sehr mühevollen und an Strapazen reichen Aufgabe, er brachte uns aber auch hochinteressante Kunde von dem sommerlichen Vogel- und sonstigen Tierleben in jenen extrem heissen Regionen, über das wir bisher so gut wie nichts wussten. Die innere Sahara ist vordem nur zu einem ganz geringen Teile zoologisch erforscht worden und auch das nur in der kühleren Jahreszeit, den Winter- und Frühlings-Monaten, in welchen die vielen durchwandernden Zugvögel naturgemäss das Bild verändern, ganz abgesehen von den Abweichungen zwischen Winter- und Sommerkleid bei manchen Vogelarten.

Ausserdem ergab sich eine znnächst gar nicht beabsichtigte, sehr günstige Konstellation insofern, als in demselben Jahre eine andere Expedition, gleichfalls mit rein wissenschaftlichen, vorwiegend zoologischen Zielen, bis tief in die Sahara eindrang, jedoch im wesentlichen auf einer anderen Route. Es waren die Herren Dr. Hartert und Hilgert, welche für das Tring-Museum wiederum eine ihrer erfolgreichen Sammelreisen ausführten. Dieselbe ging in einer mehr nach südwesten abweichenden Richtung bis ins Herz der Wüste nach In-Salah, während Herr Spatz, welcher nicht so weit nach Süden vordrang, dafür weiter östlich liegende Gebiete durchwanderte. So ergänzen sich beide Reisen in sehr interessanter Weise, und mit besonderem Vergnügen folge ich der freundlichen Aufforderung Dr. Harterts, im Anschluss an seine Bearbeitung seiner grossen Tour auch eine kurze Beschreibung der ornithologischen Ansbeute zu geben, welche Spatz bei seinem Vorstoss erzielte. Alle von ihm mitgebrachten Bälge sind direkt in meine Sammlung gekommen und liegen mir jetzt vor. Die biologischen Beobachtungen gebe ich nach dem eingehenden Bericht wieder, welchen Herr Spatz mir nach seiner Heimkehr freundlichst auf Grund seiner Aufzeichnungen zur Verfügung stellte.

Zur Reiseroute, welche auf der beigefügten Skizze dargestellt ist, möchte ich hier noch einige kurze Erläuterungen geben: In der zweiten Hälfte April traf Spatz, begleitet von zwei Präparatoren, in Biskra ein. Dort ist schon von vielen Seiten so intensiv gesammelt worden, dass er sich nur so lange aufhielt, als unumgänglich für die Reise-Vorbereitungen nötig war; dann ging es weiter nach Tonggourt, wo in den letzten Tagen des April nunmehr die Sammeltätigkeit ernstlich einsetzte. Auf dem Weitermarsche südwärts wurde bei Bled-el-Ahmar und am Brunnen ("Hassi" in der Chaamba-Sprache) Mahmar eine Anzahl Vögel erbeutet. Kurz darauf bei Arefidji kam der Forscher zum ersten mal in eine Region von Sanddünen, allerdings in kleineren Dimensionen. Hier zeigten sich sofort



typische Vogelformen der Sandwüste im Gegensatz zu den bis dahin festgestellten Vertretern des steinigen Plateaus, der Hammada. Über Ngoussa wurde am 5. v. die grosse Oase Ouargla erreicht und dort bis zum 24. v. Station gemacht. Zunächst ergab die Oase selbst eine verhältnismässig reiche ornithologische Ausbente. Sodann entpuppte sich die kleine Oase Namens "Chott" (nicht zu verwechseln mit den "Chott" genannten Salzseen), einige Kilometer weiter östlich gelegen, als ein günstiges Feld der Sammeltätigkeit. Eine Schöpfung eines reichen und einflussreichen Kaid's, ist diese ganze Anlage erst neueren Datums, dafür erfreut sie sich grossen Wasserreichtums dank der Anlage zahlreicher Brunnen und bildet mit ihren tausenden heranwachsender Dattelpalmen ein erfreuliches Bild aufblühender Bodenkultur mitten in der Wüste.

Von Ouargla ging der Marsch Ende Mai weiter fast direkt südwärts zu den Wüstenbrunnen Hassi el-Medjira und Hassi Djeribia. Die zuerst mehr vereinzelt auftretenden Sanddünen nahmen nach dem Passieren letzteren Platzes bald an Zahl und Ausdehnung zu, bis die Karawane schliesslich in die Region der riesigen, mehrere hundert Meter hohen Sanddünen, in die ureigentlichste Sandwüste, bei Aïn Taïba gelangte. Dieser Platz heisst nach einem keineswegs ganz unbedeutenden Teiche, welcher ganz unvermittelt und ziemlich versteckt zwischen den genannten Dünenhügeln vor dem überraschten Auge des Wanderers auftaucht. Er ist umgeben von einem breiten und sehr dichten Schilfgürtel, an dessen Rande vereinzelt buschartige verwilderte Palmen stehen. Hier konzentrierte sich im Juni bei enormer Hitze das Vogelleben, welches allerdings im Herzen der Wüste keineswegs sehr reich an Arten genannt werden kann. Dafür waren manche interessante Wüstenbewohner wie *Passer simplex saharae* in so grosser Zahl vertreten, dass prachtvolle Saiten gesammelt werden konnten.

Ein weiterer Vorstoss in südlicher Richtung musste nach einigen Tagemärschen infolge Wassermangels und sehr heftigen Siroccos (bei 53° C. im Schatten!) abgebrochen werden, doch wurde auf kleineren Touren die weitere Umgebung von Aïn Taïba rekognoscirt. Dann ging es während der zweiten Hälfte des Juni zunächst auf demselben Wege, den man gekommen war, wieder nordwärts bis Hassi Djeribia.

Von dort wurde eine neue weiter ostwärts führende Route eingeschlagen nach Hassi Tebonb und weiter durch eine Region mit sandigem Boden aber nur geringer Dünenformation über Hassi bou-Kiloua nach Hassi Melah ("Salzbrunnen") als dem östlichsten Punkte der Reise. Hier fanden sich verschiedene für Sandgegenden charakteristische Formen, welche bei Aïn Taïba zwischen den hohen Dünen nicht beobachtet worden waren. Leider musste infolge der sehr unglücklichen Wasserverhältnisse und entsprechend schlechten Gesundheitszustandes der Aufenthalt an diesem interessanten Platze abgekürzt und der Rückmarsch direkt auf Ouargla in fast genau westlicher Richtung angetreten werden. Hierbei überschritt die Karawane ein steiniges Plateau, welches ausgesprochen den Charakter der peträischen Sahara im Gegensatz zu der bisher passierten Sandwüste zeigte. Natürlich erschien auch sofort hier die der Steinwüste eigene Ornis. Gegen Mitte Juli wurde wieder ein kürzerer Aufenthalt in Ouargla genommen, das jedoch um diese Jahreszeit durchaus nicht als Sommerfrische gelten kann. Ebenso wie der Salzbrunnen Hassi Melah machte auch Ouargla, die "Fliegenstadt," ihrem Namen vollste Ehre. Die Route des Rückmarsches, welcher in der zweiten Hälfte des Juli ausgeführt wurde, liegt wiederum etwas östlich von der Anmarschstrasse, mit welcher sie bei Hassi Mahmar wieder zusammentrifft, um dann bis Touggourt mit

ihr gleich zu laufen. Eine kurze Rast in Touggourt und ein längerer Aufenthalt in Biskra Anfang August, dieser unfreiwillig infolge ernster Erkrankung von Spatz, beschlossen die an Strapazen aller Art überreiche Reise. Die gesamte ornithologische Ausbeute aus dieser Zeit beträgt 280 Bälge, einige Gelege und eine Fülle biologischer Beobachtungen. Auch auf den meisten anderen Gebieten der Zoologie wurde erfolgreich gesammelt, insbesondere konnte eine Reihe hochinteressanter lebender Tiere mitgebracht werden; doch das sind Momente, welche gänzlich aus dem Rahmen dieser Arbeit herausfallen. Ich erwähne sie nur hier beiläufig am Schluss, um anzudeuten, dass einer so mühevollen Arbeit auch der wohl verdiente Erfolg nicht versagt blieb. Um ihn richtig einschätzen zu können, muss man die zoologischen Verhältnisse der Wüste kennen und richtig bewerten, denn das Tierleben hier kann an Zahl der Arten wie der Individuen selbstredend weder mit den meisten paläarktischen Gebieten noch gar mit dem unerhörten Reichtum so vieler tropischer Regionen verglichen werden. Legt man aber den richtigen Massstab an, so wird man der Arbeit, welche Spatz in diesem Sommer geleistet hat, volle Anerkennung nicht versagen können.

Im folgenden führe ich nun einzeln die beobachteten und gesammelten Vogelarten auf. Da der verfügbare Raum beschränkt ist, glaube ich ohne Schaden auf die Angaben früherer Litteratur sowie Synonymik verzichten zu können. Ich beschränke mich darauf, aus Rothschilds und Harterts letzter Arbeit über Algerien: "Orn. Explorations in Algeria," *Nov. Zool.*, vol. xviii. January 1912, die entsprechenden Stellen anzugeben, um den Vergleich der verschiedenen Beobachtungen zu erleichtern.

### 1. *Corvus corax umbrinus* Sundev.

Mein Material genügt nicht, um über die Identität des südalgerischen braunen Wüstenrabens mit dem *C. c. umbrinus* aus Egypten, der terra typica, ein abschließendes Urteil zu fällen. In den Massen kann ich nebenswerte Unterschiede nicht finden.

In *Nov. Zool.* xviii. p. 471 erwähnen Hartert und Rothschild, dass ihrer Ansicht nach die Raben bei Biskra sämtlich *C. c. tingitanus* sein dürften, *C. c. umbrinus* dagegen ist ein Charaktervogel der **inneren Wüste** und wurde im Süden der Atlasländer bisher nur ganz vereinzelt erbeutet, z. B. durch Baron v. Erlanger in der tunesischen Sahara 2 Exemplare (*J. f. O.* 1899, p. 485). Die älteren Schriftsteller erwähnen ihn für die Atlasländer überhaupt nicht. Während sonst mit dem tieferen Eindringen in die Wüste die Zahl der vorhandenen Vogelarten eigentlich immer nur abnimmt bei keineswegs entsprechendem Ausgleich durch neue Gestalten, macht der Wüstenrabe hiervon eine Ausnahme: Bis Ouargla sah Spatz kein Stück, dann hie und da vereinzelte Exemplare, und erst bei Ain Taïba traf er in der Sanddünen-Landschaft einen Flug von 34 Stück, welcher ständig in die Nähe des Wassers kam. Vom ersten Tage an waren die Vögel äusserst vorsichtig, obgleich sie hier doch gewiss noch niemals Nachstellungen erfahren hatten. Es gelang trotz vieler Mühe nur 3 Raben gleich zu Anfang am 2-3. vi. zu erlegen. Einer ist ♂ ad. mit 394 mm. Fllg., die beiden anderen sind voll erwachsene Junge aus demselben Jahre. Das Gefieder des alten Vogels ist abgenutzt. Auch bei den Streifereien südlich von Ain Taïba wurden noch mehrfach Wüstenrabens beobachtet, ihre Häufigkeit nimmt also nach Süden hin zu, soweit die Expedition diesmal in die Wüste vordrang.

2. *Oriolus oriolus oriolus* (L.).

Rothschild und Hartert, *Nov. Zool.* xviii. p. 474.

Ob der Pirol im Norden Algeriens brütet, ist noch nicht ganz zweifellos, jedenfalls passiert er recht zahlreich den Süden gelegentlich seines späten Frühjahrszuges. Spatz sammelte noch am 11. v. ein ♀ ad. in Ouargla.

3. *Chloris chloris aurantiiventris* Cab.

Rothschild und Hartert, *Nov. Zool.* p. 475.

Dieser lebhaft gefärbte Grünfink, welcher schon in Nord-Algerien brütet, wurde als Durchzügler noch Ende April in Biskra angetroffen, ♀ dort am 26. iv. erlegt.

4. *Carduelis carduelis africanus* Hart.

Rothschild und Hartert, *Nov. Zool.* p. 476.

Der afrikanische Stieglitz bewohnt als Brutvogel zwar ganz Algerien südwärts bis Biskra, doch liegen keine Beobachtungen über sein Vorkommen in der eigentlichen Wüste vor, Spatz sammelte ein ♂ ad. am 23. iv. in Biskra.

5. *Passer domesticus tingitanus* & *P. hispaniolensis flückigeri*.

Rothschild und Hartert, *Nov. Zool.* p. 479, T. xi.

Folgendes recht reichhaltige Material liegt mir vor:

ad. ♂, 3 ♀ ♀, Biskra, 23. iv.  
 ad. 5 ♂ ♂, ♀ ♀, Touggourt, 27–30. iv.  
 ad. 23 ♂ ♂, 12 ♀ ♀, Ouargla, 8–20. v.  
 juv. 3 ♂ ♂, ♀                   "                   "  
 ad. 3 ♂ ♂, Ouargla 4. vii.   Sa. 52 Ex.

Rothschild u. Hartert haben in ihrer Arbeit mit dankenswerter Ausführlichkeit die Frage der Systematik bei den südalgerischen Sperlingen besprochen. Sie kommen zu dem Resultat, dass man die Mehrzahl überhaupt nicht als reine Rasse sondern als Kreuzungsprodukte eines Haussperlings (*P. domesticus tingitanus* Loche) und eines Weidensperlings (*P. hispaniolensis flückigeri* Klschdt.) zu betrachten habe. Wie ausserordentlich gross die individuelle Variation ist, wird durch eine sehr interessante Tafel bewiesen, welche 20 verschiedene Kopfplatten in grau, rot, schwärzlich, gesprenkelt und allen Zwischenstufen zeigt. Eines dieser Kleider habe ich als *P. italiae bergeri* (*O. M.* 1908 p. 41) beschrieben, auf ähnliche Stücke beziehen sich jedenfalls auch die vielen sonst in der Litteratur vorkommenden Angaben über die Erlegung von *P. italiae* in N.-Afrika. Ich schicke voraus, dass ich auf Grund meines neuen schönen Materials zu derselben Schlussfolgerung wie Hartert komme, also die Sperlinge als Bastarde aussehe und den Namen *P. italiae bergeri* dem entsprechend einziehe. Ich kann aber nicht umhin, den Verdacht auszusprechen, dass vielleicht der *P. italiae* überhaupt das Produkt einer Vermischung von *P. domesticus* und *hispaniolensis* ist. Es würde zu weit führen, hier diese sehr schwierige Frage zu erörtern. Wer bei Hartert in *V. d. p. F.* pp. 148–158 die Angaben über die Verbreitung von *P. d. domesticus*, *P. italiae* und *P. hispaniolensis* nebst Subspecies nachliest, wird finden, dass überall einzelne Vertreter der einen Form mitten zwischen solchen der anderen gefunden worden sind. Das gibt doch zu denken, und so sind mir, wie gesagt, Zweifel daran gekommen, ob *P. italiae*



wirklich eine gute Art und nicht vielmehr entweder ein Mischprodukt ist oder, was fast auf dasselbe hinauskommen würde, eine rotköpfige Varietät von *P. domesticus*. Unter den ♂♂ meiner schönen Suite sind jedenfalls einige Rotköpfe ganz ohne jeden Längsflecken an den Brustseiten, welche ich von typischen *italiae* nicht unterscheiden kann, auch ihre Wangen sind meist rein weiss.

Eine weitere Reihe gleicht ganz dem Typus meines nunmehr eingesargten *P. italiae bergeri*, d. h. Unterseite ohne dunkle Streifen, Kopfplatte rot und grau gemischt, nach vorn zu grauer. Einige wenige könnte man auf Grund von mehr oder weniger schwärzlicher Zeichnung auf dem Oberkopfe als *P. d. tingitanus* ansprechen. Auch der Charakter von *P. h. flückigeri* mit ganz geringen dunklen Seitenstreifen und rötlichem Kopfe ist vertreten, **starke** Seitenstreifen zeigt nur ein ♂ aus Ouargla 4. vii., doch hat auch dieses noch weit weniger schwarz als echte *hispaniolensis* meiner Sammlung aus Nord-Tunesien bezw. meine *P. hispaniolensis washingtoni* Tsch. aus Suez und El-Tor. Ich fasse meinen Befund dahin zusammen: Durch dauernde Kreuzung zweier ursprünglich recht verschiedener Formen bildet sich hier anscheinend allmählich eine neue Rasse heraus. Bis heute ist es noch unmöglich zu sagen, welcher Färbungscharakter dominieren wird. Auf der Unterseite ist die Ähnlichkeit mit *domesticus* entschieden vorwiegend, die dunklen Seitenstreifen fehlen meist ganz oder sind schwach angedeutet. Auf der Oberseite zeigt der Rücken meist keine nennenswerten Unterschiede gegenüber typischen *hispaniolensis*; auf der Kopfplatte findet man alle denkbaren Variationen: reines rotbraun ist häufig und zwar ebenso bei abgenützten Kleidern (Biskra, Touggourt, iv.), wie bei frischen (Ouargla vii.). Eine ganze Serie von Ouargla v. zeigt grau mit rotbraun gemischt; vereinzelt sind zwischen grauen auch schwärzliche Federchen eingesprengt, ein ♂ trägt eine nach hinten zu rein rotbraune, vorn mehr schwärzliche Kopfplatte. Die ♀♀ unterscheiden sich nicht merklich von einander, ein schwärzlicher Kehlfleck ist wiederholt mehr oder weniger deutlich hervortretend, ich halte das lediglich für ein Zeichen höheren Alters. **Alle** ♂♂ ad. haben schwarze Schnäbel, **alle** ♂♂ juv. und ♀♀ zeigen brannen Ober- und gelben Unterschnabel.

In den Oasen, speciell in Ouargla, wo er sehr häufig ist, nistet der Sperling nach Spatz' Beobachtungen in Häusern, ist also biologisch ein *domesticus*, genau wie ich es s. Z. in Gafsa fand. In der Oase versammelten sich alltäglich massenhaft Sperlinge in den Palmen über einem abgeernteten Weizenfelde, doch war auf keinem der Bäume ein Nest zu finden, alle standen im Gemäuer der Araberstadt. In derselben Weise besucht ja auch unser Haussperling scharenweise die Felder rings um die Dörfer, ohne deshalb häufiger in den unmittelbar benachbarten Baumgruppen der Gärten statt in Häusern und Ställen zu nisten.

## 6. *Passer simplex saharae* Erl.

Rothschild und Hartert, *Nov. Zool.* p. 482.

Dieser Sperling scheint, ähnlich dem Wüstenraben, erst im Herzen der Sahara recht häufig zu werden. Er ist ein typischer Bewohner der **Sandwüste**: als Spatz bei Arefidji am 4. v die ersten kleinen Dünen passierte, konnte er auch sofort die beiden ersten ♂♂ sammeln. Einen Monat später bei Ain Taïba fand er dann den Vogel in grosser Menge, ich besitze von dort 7 ♂ ad., 6 ♂ juv., 1 ♀ ad., 5 ♀ juv. (2-5. vi.). Es ist wohl angebracht, diesen Platz einmal etwas genauer zu beschreiben: Mitten zwischen 2-300 m. hohen Sanddünen liegt versteckt ein Teich,

der im Juni noch 40–50 m. Durchmesser des Wasserspiegels hatte, rings umgibt ihn ein breiter Schilfgürtel. In diesem erheben sich einige alte verfilzte und buschartige wilde Dattelpalmen, in welchen der Wüstensperling **kolonieartig** nistet. Eine grosse Zahl von Vögeln, ad. wie juv., hielt sich den ganzen Tag über in diesen Palmbüschchen auf, überall hingen unordentlich Reste vom Nistmaterial herum, doch gelang es nicht mehr, besetzte Nester zu finden. Glücklicher war Spatz kurz darauf beim Hassi Medjira, wo er am 26. vi. ein Nest mit 3 etwas angebrüteten Eiern im Brunnen fand. Daneben im Innern eines kleinen Marabout mit einem Loch in der Kuppel entdeckte er bald darauf etwa manns hoch über dem Boden in einer Ecke noch ein zweites Nest ebenfalls mit 3 Eiern (beide Gelege nebst den Alten zu letzterem befinden sich heute im Museum Koenig). Es scheint mir danach, als machte hier der Wüstensperling seine erste Brut ziemlich regelmässig im April, aus ihr stammen die zahlreich bei Ain Taiba gefundenen schon flüggen Jungen. Dann kommt gegen Ende Mai eine zweite Brut. Auf dem Rückmarsche sammelte Spatz noch am 13. vii. bei Hassi bou-Chesana ♂ ♀ juv., beide in der Mauser begriffen, das ♂ zeigt Anfänge des schwarzen Kehlflecks. Es ist jedenfalls bewiesen, dass der Vogel in der Wahl seines Nistplatzes nicht an die Wüstenbrunnen sich bindet, wie Koenig glaubte, sondern sich den verschiedensten Lokalitäten anbequemt. Nimmt man einige frühere Beobachtungen hinzu: Tristram berichtet von Nestern in Palmen, v. Erlanger fand ein Nest bei Bir Aouine (Tunes. Sahara) in einem hohlen Baumstamm und Spatz im März 1898 ebenfalls in der Tunesischen Sahara Nester unten in dem mächtigen Horste des grossen braunen Geiers (wohl *Vultur monachus*) eingebaut, während gleichzeitig auch die Geier bereits gelegt hatten, Hartert, 1909, fand Nester in Palmen und in einem Loche in einem Stamme,—so kann man mit Recht von einer grossen Anpassungsfähigkeit reden, da Gebäude, Brunnen, Palmen, hohle Bäume und Geierhorste abwechselnd als Nistplätze dienen.

Die Schnabelfarbe ist nicht ein Kennzeichen der Unterart, wie v. Erlanger glaubte, sondern wechselt nach Geschlecht und Jahreszeit, wie schon Hartert sehr zutreffend erklärte. Von meinen Vögeln zeigen 4 ♂ ad. ganz schwarze Schnäbel, 5 ♂ ad. nur ganz schwarzen Oberschnabel und an der Wurzel gelblichen Unterschnabel, 1 ♂ ad. hat überhaupt gelblichen Schnabel, nur die Spitze des Oberschnabels ist bräunlich, dieses ist auch in der Mauser schon weiter vorgeschritten als alle anderen. Alle ♂ ♂ juv. und ♀ ♀ haben vorwiegend gelbe Schnäbel, meist ist der Oberschnabel etwas dunkler. Bei allen ♂ ♂, auch den juv., zeigt sich die Neigung zu etwas stärkerem Schnabel als bei den entsprechenden ♀ ♀.

#### 7. *Emberiza striolata sahari* Lev.

Rothschild und Hartert, *Nov. Zool.* p. 484.

Dieser Ammer ist durchaus kein Bewohner sandiger Wüste. Spatz fand ihn in Biskra ziemlich häufig, hingegen von Touggourt an südlich in der ganzen Sandregion nicht mehr, während ihn Hartert im steinigen M'zab recht weit südlich als Brutvogel noch bei Ghardaïa feststellte.

#### 8. *Eremophila (Otocorys auct.) alpestris bilopha* (Temm.)

Rothschild und Hartert, *Nov. Zool.* p. 498.

Diese reizende, steiniges Gelände in der Sahara bewohnende Ohrenlerche wurde nur in zwei jungen Stücken, einem ♂ und einem ♀, am 13. und 14. vii bei Hassi bou-Chesana nördlich von Ouargla erbetet. Beide Stücke befinden sich in dem

vom Alterskleide dieser Ohrenlerche so ganz abweichenden Jugendgefieder, sodass ich zunächst glaubte, eine *Ammomanes* vor mir zu haben. Die richtige Bestimmung nahm Dr. Hartert vor, der ebensolche Stücke im Juni erbeutete. Ausserdem ist das ♂ noch abnorm, indem an den Handschwingen beide Fahnen isabell gefärbt sind. Alte Vögel wurden leider von Spatz nicht erbeutet. Hartert fand die Art nicht südlicher als auf einer Linie von Ghardaia nach Guerrara und von dort nach El-Alia.

#### 9. *Ammomanes phoenicura arenicolor* Sund.

Rothschild und Hartert, *Nov. Zool.* p. 487.

In dankenswerter Weise sammelte Spatz eine grössere Suite aus den verschiedensten Lokalitäten:

- 4 ♂♂, ♀ ad. Bled-el-Ahmar 1-2. v.
- ♀ ♀ ad. Hassi Mahmar, 3. v.
- ♀ ad. Arefidji, 5. v.
- ♀ ad. Hassi Djeribia, 29. v.
- ♂ ad. Ain Taiba, 9. vi.
- ♀ ad. Hassi Teboub, 17. vi.
- ♂ ad. Hassi Melah, 22. vi.
- ♂ ad. Peträische Sahara, südöstl. Ouargla, 2. vii.
- ♀ juv. Hassi bou-Chesana, 13. vii.
- ♂ juv. Hassi Mahmar, 15. vii.

Meine Stücke messen:

- ♂♂ ad.: Fl. 91-97, Schnabel 11-13, meist 12 mm.
- ♀ ♀ ad.: Fl. 85-89, Schnabel 10-11,5 mm.

Wie bei allen *Ammomanes* hat ♀ fast stets zierlicheren Schnabel und etwas kleineres Flügelmass als ♂.

Der einzige Vogel aus typischer Steinwüste, ♂ vom 2. vii, unterscheidet sich sofort von allen anderen durch rötere Oberseite, besonders deutlich erscheint diese Färbung auf der Kopfplatte. Er trägt hier schon eben hervorgekommene frische Federn, die früher erlegten Stücke sind im abgetragenen Kleide. Vielfach tritt hier infolge Abnutzung die dunklere Basis der Federn stärker hervor als beim frischen Kleide. Leider fehlt es an genügendem Material von **frisch vermauserten** Vögeln, um entscheiden zu können, ob die Bewohner der Sandwüste sich von denen der Steinwüste etwa in ähnlicher Weise unterscheiden wie *Galerida theklae deichleri* und *G. t. carolinae*. Im **abgenützten Gefieder** vermag Dr. Hartert, dem ich meine Stücke zum Vergleich sandte, einen konstanten Unterschied nicht festzustellen. Überdies teilt er mir freundlichst aus seiner Erfahrung mit, dass bei **allen** *Ammomanes* aus der Wüste durch das oft unvermeidliche Waschen des Balges ungewöhnlich grosse Veränderungen in der Färbung resultieren, sodass man doppelt vorsichtig sein muss. Meine jungen Vögel vom Juli sind schon ziemlich abgenutzt in ihrem Kleide.

Während in Tunesien nach **allen** vorliegenden Beobachtungen von Erlanger, Spatz, mir und vielen anderen diese Lerche nur in der Steppe und auf steinigem Plateaus, hingegen anscheinend nicht in der Sandregion vorkommt, bindet sie sich in der Algerischen Sahara keineswegs an so bestimmte Örtlichkeiten. Dr. Hartert teilt mir freundlichst mit, dass er sie auf seiner letzten Reise vorzugsweise auch auf steiniger Hammada und nur ausnahmsweise in sandiger Ebene bei Tidikelt und nördlich von El-Alia angetroffen habe. Dagegen schildert sie mir Spatz als eine in

der eigentlichsten Dünenwüste ebenfalls alltägliche Erscheinung. Er fand sie sogar häufiger in ausgesprochener Sandgegend, so in den niederen Dünen bei Arefidji, Hassi Djeribia und Hassi Melah, zwischen den hohen Dünen bei Ain Taïba und Hassi Teboub. Die dort gesammelten Exemplare sind nicht etwa Irrgäste, sondern Belegstücke aus einer grösseren Zahl beobachteter Vögel. Meist hielten sie sich paarweise, oft hörte Spatz ein ♂ locken, doch kamen auch kleine Trupps vor, wohl Familien. Da es sich um eine fortgesetzte Reihe von Beobachtungen zwischen Anfang Mai und Mitte Juli handelt, halte ich es für so gut wie ausgeschlossen, dass diese Art irgendwo anders, etwa nur auf den Steinplateaus, brüten sollte, um erst nachher auch in der Sandwüste zu erscheinen. Dem widerspricht **alles**, die Zahl der gesehenen Vögel, ihr Benehmen, die Jahreszeit. Auch andere Lerchenarten zeigen bisweilen in der Wahl ihres Aufenthaltes eine scheinbar recht auffällige Inkonsequenz. Ich erwähne nur *Fremophila alpestris bilopha* Temm., welche als ein ausschliesslicher Wüstenbewohner galt, bis ich sie als gar nicht so seltenen Standvogel in der Lehmsteppe unweit von Gabès in den Jahren 1905–06 konstatierte (vgl. *J. f. O.*, 1909. ii. pp. 182–4).

Als interessant muss ich noch hervorheben, dass Spatz die kleine *Ammomanes* fast stets zusammen mit *Alaemon alaudipes alaudipes* fand. Ganz übereinstimmend beobachtete ich selbst im Januar 1908 wie Ende März 1911 *Ammomanes deserti isabellina* und *Alaemon alaudipes desertorum* stets beisammen an einer bestimmten Stelle unweit Suez, hingegen sonst nirgends in der ganzen Gegend.

#### 10. *Galerida cristata arenicola* Tristr.

Rothschild und Hartert, *Nov. Zool.* p. 493.

Es stimmt mit Harterts Befund durchaus überein, dass diese südlichste Form der langschnäbligen Haubenlerche in den Atlasländern nicht gar weit in die Wüste vordringt. Mir liegen folgende Stücke vor:

♂ 25. iv. Djemaa, nördl. Touggourt.	} Flügellg. 98–104 mm., nach Hartert } <i>V. d. p. F.</i> , p. 232 grösser: 107–112 mm.
♂ ♀ 27. iv. Touggourt.	
♂ 1. v. Bled-el-Ahmar.	

Alle wurden auf oder an der Strasse unweit der Ortschaften erlegt.

#### 11. *Galerida theklae deichleri* Erl.

Rothschild und Hartert, *Nov. Zool.* p. 495.

Zwar ist diese kurzschnäblige Haubenlerche ein Charaktervogel sandiger Landstriche, doch kommt sie anscheinend zwischen den ganz hohen Sanddünen nicht vor. Im flacheren Sandgelände bei Arefidji war sie häufig, es wurden dort am 4. und 5. v. ohne grosse Mühe 4 ♂, ♀ ad. sowie 2 ♂ juv. gesammelt. Weiter südwärts fand Spatz sie nicht mehr, auf der Rückreise erlegte er dann wieder ♂♂ juv. am 17. vii. bei Bled-el-Ahmar und ♂ juv. am 26. vii. bei Bordj Chegga, südlich Biskra. Entgegen ihren sonstigen Gepflogenheiten hielten sich die Vögel am 17. vii. auf einem Stoppelfelde **innerhalb der Oase** auf.

#### 12. *Alaemon alaudipes alaudipes* Desf.

Rothschild und Hartert, *Nov. Zool.* p. 497.

Im Gegensatz zu den Haubenlerchen ist die grosse Wüstenläuferlerche ein Charaktervogel der Wüste bis in ihr Herz hinein, und zwar ganz gleich, ob grosse,

kleine oder gar keine Dünen vorhanden sind. Spatz erklärt sie als die häufigste, d.h. am allgemeinsten verbreitete Vogelart, welche er auf seiner Wüstentour antraf. Folgende Bälge bestätigen das :

♂♂ ♀ ad., ♂ juv., 1. und 2. v., Bled-el-Ahmar.

♂ juv., 3. v., Hassi Mahmar.

♀ (?) juv., 5. v., Arefidji.

♂♂ ad., 29. und 31 v., Hassi Djeribia.

♂♂ juv., 17. vi., Hassi Djeribia.

3 ♂ juv., 13. und 16. vii., Hassi bou-Chesana und Hassi Mahmar.

Bei Arefidji wurde am 4. v. ein Nest mit 4 frischen Eiern gefunden. Es stand wie gewöhnlich oben auf einem kleinen Busch, doch bedeutet die Zahl von 4 Eiern eine Seltenheit, sonst beträgt das Gelege dieser Lerche nur 3 Eier. Auch die Masse derselben sind in diesem Falle ungemein gross. Das schöne Gelege befindet sich jetzt im Museum Koenig.

Ende Mai wurden flügge Junge noch gefüttert. Wegen der sehr erheblichen Unterschiede in Massen und Färbung bei beiden Geschlechtern verweise ich auf meine Ausführungen *J. f. O.* 1909. ii. p. 164. Ergänzend hierzu bemerke ich in Bezug auf die jungen Vögel, dass auch schon in diesem frühen Stadium beim ♂ der längere—wenn auch noch nicht ganz ausgewachsene—Schnabel gegenüber dem gleichaltrigen ♀ anfällt. Die Oberseite ist rötlicher, sandfarbener als bei **allen** alten Vögel. Die ersten 2–3 Handschwingen sind bei **allen** juv. **beider** Geschlechter blass wie beim ♀ ad., niemals dunkel wie beim ♂ ad. auch im abgenützten Gefieder.

### 13. *Anthus trivialis trivialis* L.

Rothschild und Hartert, *Nov. Zool.* p. 498.

Während des März und April ist der Baumpieper nach Hartert ein im Süden häufiger Durchzügler. Ein verspäteter Gast (♀ ad.) wurde noch am 20. v. in der Oase Chott bei Ouargla an einem sumpfigen Graben hochgemacht und von Spatz erlegt.

### 14. *Anthus cervinus* Pall.

Gleichzeitig mit vorigem wurde auch ein Rotkehlpieper ♀ geschossen, dessen Unterseite recht lebhaft gefärbt ist, also gewiss kein junger Vogel.

Dieser Fall ist interessant, da die Art eigentlich dem Osten angehört und gerade für Algerien bisher nur ganz selten festgestellt wurde. Hartert in *V. d. p. F.* i. p. 278 nennt ihn in Egypten, wo auch ich ihn mehrfach sammelte, einen häufigen Wintergast, in Tunis schon seltener, in Marokko ganz selten, für Algerien erwähnt er ihn nicht. Auch Koenig fand ihn wohl vereinzelt in Tunis, hingegen spricht er *J. f. O.* 1895, p. 410 ausdrücklich aus : “*A. cervinus* ist mir nicht begegnet (in Algerien).” Bei dieser Gelegenheit möchte ich bemerken, dass v. Erlangers Vermutung, dieser Pieper brüte bei Gafsa, wo der Forscher Ende April und Anfang Mai einige Stücke erbeutete, sicher ganz unzutreffend ist, denn die Brutgebiete liegen weit im Nordosten Europas. Hingegen haben wir hier wieder einmal typische Beispiele dafür, dass nicht selten alte und durchaus gesunde Zugvögel sich noch in Afrika zu einer Zeit herumtreiben, in welcher bereits die Mehrzahl ihrer Artgenossen längst wieder in die nordische Heimat zurückgekehrt ist und sich dort dem Brutgeschäft widmet.

Über das Vorkommen dieses Piepers in Algerien finde ich nur Mitteilungen in den älteren Werken von Loche und Taczanowski.

15. *Motacilla flava flava* L.

Rothschild und Hartert, *Nov. Zool.* p. 499.

Bei Touggourt traf Spatz Ende April auf einem gemähten Gerstenfelde einen grösseren Schwarm Kuhstelzen, welcher, soweit sich feststellen liess, nur aus ♂♂ bestand. Belegexemplare wurden geschossen. Viel später dann am 2. vi. wurde bei Ain Taiba noch ♀ semiad. erlegt, es trägt fast noch reines Jugendkleid, doch zeigt sich auf dem Kropfe auffallend starke dunkle Wölkung. Derartige Erscheinungen kommen vereinzelt hie und da vor, auch das Berliner Museum besitzt unter seinen vielen Bälgen einen ganz ähnlich gezeichneten Vogel. Gleichzeitig wurden noch 3-4 Stück beobachtet.

16. *Motacilla flava dombrowskii* Tsch. ?

Bei der gleichen Gelegenheit wurden auch 2 ♂ erlegt mit auffallend dunklen Ohrdecken, ziemlich düster granem Oberkopf und deutlich weissem Superciliarstreifen. Unter einander stimmen sie aber wieder nicht vollkommen überein, eins zeigt ganz den Färbungscharakter von *M. f. dombrowskii*, das andere steht an der Grenze zwischen dieser Art und *flava*. Für *dombrowskii* ist Rumänien die terra typica, es erscheint aber sehr unwahrscheinlich, dass Brutvögel von dort auf dem Zuge Süd-Algerien passieren sollten. Eher halte ich das für möglich bei Gästen aus dem zentralen Russland (vgl. z. B. *Anthus cervinus*). Da die Grenzen der Brutreviere von *M. f. flava* und *M. f. dombrowskii* bisher noch nicht scharf abgeteilt sind (vgl. Hartert, *V. d. p. F.* i. p. 288-9), halte ich es doch nicht für ausgeschlossen, dass letztere Form in ihrer Heimat weiter nördlich hinaufgeht, als meist angenommen wird, und dann auf dem Zuge auch gelegentlich weit nach Südwesten verstreicht. Recht dunkelohrige *M. f. flava* kommen übrigens auch sonst in verschiedenen Teilen Europas vereinzelt vor.

17. *Lanius excubitor elegans* Swains.

Rothschild und Hartert, *Nov. Zool.* p. 500.

Der blasse Raubwürger bewohnt mehr den Rand der Wüste als ihr Inneres, immerhin brüten einzelne Pärchen doch recht weit südlich. So erhielt ich ♀ ad., 2 ♂♂, 2 ♀♀ juv. aus Hassi bou-Chesana 14. vii. und Hassi Mahmar, 15. vii. Ein ♂ ad. habe ich von Bordj Chegga, südlich Biskra, 26. vii., dieser Fundort liegt also ganz wesentlich nördlicher. Südlich von Ouargla in den grossen Dünen scheint der Würger während der Brutzeit nicht mehr vorzukommen.

18. *Lanius senator senator* L.

Rothschild und Hartert, *Nov. Zool.* p. 501.

Ich verweise auf Rothschilds & Harterts Bemerkungen über die Systematik, bei welchen er die Form "flückigeri" einzieht.

Mir liegen ♂♀ ad. Biskra, 23. iv. vor, alle tragen frisches Gefieder mit sehr breiter schwarzer Stirnbinde, der Flügelspiegel ist deutlich vorhanden, also kommt die Form "L. s. badius" nicht in Frage.

Der rotköpfige Würger hat es im Frühjahr mit dem Zuge nicht eilig, der Termin der Erlegung Ende April kann nicht als abnorm spät gelten.

19. *Muscicapa hypoleuca speculigera* Bp.

Rothschild und Hartert, *Nov. Zool.* p. 503.

Nur ein ♂ Biskra 23. iv. erhielt ich diesmal; das Schwingen-Verhältnis ist deutlich: 5. länger als 2., die äussersten Steuerfedern zeigen an den Aussenfahnen schmale weisse Säume, sonst ist der Schwanz schwarz. Der Flügel misst 78 mm. Es handelt sich zweifellos um die in Nordafrika brütende Form, welche von der europäischen sehr wohl unterscheidbar ist.

20. *Muscicapa collaris* Bechst.

Dieser Fliegenfänger ist in Algerien anscheinend ein viel seltenerer Durchzügler als in Tunesien, wo unter anderen auch v. Erlanger während des April 1893 und 1897 mehrere Exemplare erbeutete. Der Kopf des einen ist *J. f. O.* 1899. p. 507. Fig. 3 abgebildet. Für Algerien hingegen liegen nur einige ältere Angaben von Malherbe und Loche vor. Hartert in den *Novitates* erwähnt den Vogel nicht, und in den *V. d. p. F.* p. 484 nur als Durchzügler bezw. Wintergast für Egypten. Es ist somit doch recht interessant, dass Spatz mir ein schönes ♂ aus Ouargla 13. v. mitbringen konnte. Der weisse Halsring ist sehr breit, der weisse Stirnfleck recht ausgedehnt, ähnlich wie auf der Abbildung bei v. Erlanger. Die beiden äusseren Paare der Steuerfedern haben am Ende schmale weisse Säume, welche auf den beiden linken Federn recht ausgeprägt, auf den beiden rechten kaum wahrnehmbar sind. Das Gefieder ist ziemlich frisch.

21. *Muscicapa striata tyrrhenica* Schiebel. (?)

Bei meinen 2 Stücken, ♂ 4. v. Arefidji und ♀ 3. vi. Aïn Taïba, ist der Vorderkopf sehr blass mit nur schwacher Strichelung, auch die Unterseite zeigt nur verwaschene Längsflecke. Es fehlt mir leider an Vergleichsmaterial in grösserer Suite, aber nach der Beschreibung von Schiebel (*Orn. Jbch.* 1910, p. 102) und den Bemerkungen in *Nov. Zool.* p. 503 glaube ich meine Vögel zur sardinischen Form ziehen zu sollen.

22. *Phylloscopus trochilus trochilus* L.

Rothschild und Hartert, *Nov. Zool.* p. 504.

Dieser am Nordrande der Wüste von Ende Febrnar bis Mitte April häufig auf dem Zuge erscheinende Laubsänger wird gelegentlich in einzelnen Exemplaren auch noch später angetroffen. Mir liegt hier ♂ 23. iv. Biskra und ♀ 20. v. Oase Ouargla vor. Interessant ist die sehr erhebliche Differenz in den Massen, diese sind folgende:

	Lg.	Fl.	Schwarz.	Schnabel.
♂	131	68	50	11 mm.
♀	115	62	47	7,5 mm.

Bei beiden ist 2 Handschwinge merklich länger als 4, es sind überhaupt typische *trochilus*, wie mir Dr. Hartert bestätigte, dem ich sie zur Ansicht sandte. Ich halte es für wichtig darauf hinzuweisen, wie erheblich geringer die Masse beim ♀ sind.

23. *Acrocephalus arundinaceus arundinaceus* L.

Rothschild und Hartert, *Nov. Zool.* p. 504.

Der grosse Rohrsänger, den Hartert und Hilgert im April 1909 nur gesehen aber nicht gesammelt haben (Route Biskra—Touggourt), wurde von Spatz in 3 Exemplaren mitgebracht; ♂ 8. v. Onargla und ♀♀ 18–20. v. Chott bei Onargla. Alle zeigten sich ziemlich scheu und wurden natürlich nur am Wasser in den Oasen angetroffen. Das ♂ sang nicht. Es dürfte sich um Zugvögel handeln, darauf deutet auch der Umstand hin, dass ♂ zuerst, später nur ♀♀ erlegt wurden.

Ein merkbarer konstanter Unterschied gegenüber unseren heimischen Drosselrohrsängern im gleichen Stadium des Gefieders scheint mir nicht wahrnehmbar, etwas individuelle Variabilität des Brauns auf der Oberseite ist auch bei schlesischen Brutvögeln, von denen ich eine grosse Suite besitze, nicht selten.

24. *Acrocephalus streperus streperus* L.

Rothschild und Hartert, *Nov. Zool.* p. 504.

Von Hartert wurde auch dieser Rohrsänger nur gehört, ich erhielt jetzt ♂♀ 18–20. v. aus der Oase Chott bei Onargla. Hier kam der Vogel neben seinem vorher erwähnten Verwandten vor, war aber anscheinend recht selten, denn ausser diesen 3 kamen weitere Stücke nicht zur Beobachtung. Die Stimme wurde nicht gehört. Auch hier handelt es sich höchst wahrscheinlich um nordische Gäste.

Die Färbung oberseits ist etwas weniger rotbräunlich als bei schlesischen Vögeln, doch liegt mir zum Vergleiche nur eine Serie heimischer Stücke aus dem August und September vor, deren frisches Gefieder naturgemäss etwas anders aussehen muss.

25. *Acrocephalus schoenobaenus* L.

Rothschild und Hartert, *Nov. Zool.* p. 504.

Etwas anders liegen die Verhältnisse bei diesem als bei den beiden vorigen *Acrocephalus*. Jene erscheinen im Saharagebiete nur selten und ziemlich sicher als Gäste, der Schilf-Rohrsänger hingegen wurde in der zweiten Hälfte des Mai noch recht zahlreich mitten in der Wüste gefunden: es liegen mir 9 Ex. 18–22. v. aus den Oasen Onargla und Chott vor. Eine erheblich grössere Zahl wurde erlegt, doch gingen manche Vögel in für Erbeutung schwierigen Gelände verloren, andere waren so zerschossen, dass sie nicht gebalgt werden konnten. Sehr unglücklicherweise sind alle 9 vorhandenen Stücke ♀♀, ob unter den anderen sich ♂♂ befanden, vermag ich natürlich nicht zu sagen, immerhin erscheint es nicht unwahrscheinlich, da, wie gesagt, der Vogel an den grossen Zuleitungsgräben im Gebüsch direkt häufig war. Sollten das alles ♀♀ gewesen sein, so wäre der Beweis allerdings so gut wie erbracht, dass es sich nur um Gäste handeln kann, bei welchen ja sehr oft die Geschlechter getrennt ziehen, dann die ♀♀ stets später. Nicht versäumen möchte ich, auf einen Parallel-Fall hinzuweisen: v. Erlanger sammelte am 16–17. Mai 1901 in Wante, S. Somaliland, 2 ♂♂, 5 ♀♀ ad. dieses Vogels (vgl. Cat. Hilgert, p. 192), welche ich selbst in Ingelheim untersucht habe und nicht von deutschen *A. schoenobaenus* unterscheiden kann. Es bleibt also die gewiss interessante Frage offen [ : 1.] Brütet der Schilf-Rohrsänger nur im Norden der Atlasländer, wie es Rothschild und Hartert konstatierten, und erscheint er noch weit im Inneren des schwarzen Erdteils spät im Mai nur als häufiger Gast [ : 2.] Erstreckt sich das Brutgebiet bis tief in die Sahara hinein und in N. O. Afrika bis zum S. Somaliland?



26. *Hypolais icterina* Vieill.Rothschild und Hartert, *Nov. Zool.* p. 504.

Die mitgebrachten beiden Stücke, ♀ 19.v. Ouargla, ♂ 20.v. Chott bei Ouargla, gehören zu dieser Art und nicht zu *polyglotta*, wie man annehmen sollte, da letztere in der West-Sahara anscheinend brütet (vgl. Hartert, *V. d. p. F.* p. 572). Bei meinen Vögeln ist die 1. Handschwinge kurz, kaum länger als die Handdecken, 2 länger als 5., Fllg. 75-76 mm. Bei *polyglotta* ist die 1. Schwinge bedeutend länger, 2. = 5. oder kürzer, Fllg. 64-70 mm.

27. *Hypolais pallida opaca* Cab.Rothschild und Hartert, *Nov. Zool.* p. 505.

Dieser im Norden und Centrum der Atlasländer nistende Vogel kommt auch noch spät im Jahre vereinzelt weit im Süden vor. Schon Hartert fand ihn bis Ende April in Biskra und Touggourt, Spatz sammelte sogar ♀ am 21.v. bei Ouargla. Die sehr grossen und breiten Schnäbel charakterisieren diese Form auf den ersten Blick gegenüber *H. p. reiseri*, ganz abgesehen von der viel blosseren Oberseite bei letzterer.

28. *Hypolais pallida reiseri* Hilg.Rothschild und Hartert, *Nov. Zool.* p. 505.

Die algerische Sahara ist die Heimat dieses blassen Vögelchens mit dem relativ zierlichen Schnabel, aber bisher scheint noch kein Ort gefunden zu sein, wo es wirklich häufig vorkommt. Ich erhielt ein ♂ 21.v. Chott bei Ouargla, ♂ ♀ 22.v. Ouargla, ♀ 17.vii. Bled-el-Ahmar. Das Benehmen ist lebhaft, der schnalzende etwas monotone Gesang soll merklich von dem der *H. p. opaca* verschieden sein.

29. *Sylvia nana deserti* Loche.Rothschild und Hartert, *Nov. Zool.* p. 507.

Ein echtes Kind der Wüste zieht diese kleine sandfarbene Grasmücke sandige Landstriche allen anderen vor, doch fand sie Spatz nicht zwischen den ganz hohen Dünen, sondern im Gelände mit mässigen Sandwellen. Dort an geeigneten Platzen ist sie nicht selten, wie folgende Serie zeigt: 3 ♂♂, 2-3. v., Bled-el-Ahmar; 4 ♂♂, 2♀, 20-23. vi., Hassi Melah (östlichster Punkt).

30. *Sylvia cantillans cantillans* Pall.Rothschild und Hartert, *Nov. Zool.* pp. 508, 509.

Es liegt mir nur ein Stück vor: ♂, 20. v., Chott bei Ouargla. Nach der Flügelform kann nur *S. c. cantillans* oder *inornata* in Frage kommen, da die 2. H. S. zwischen der 5. und 6. steht. Man sollte nun so spät im Jahre hier weit eher noch eine *inornata* vermuten, den Brutvogel der Atlasländer, als *cantillans*, einen Gast aus Europa. Bei sorgfältigem Vergleich muss ich diesen Vogel trotz seiner lebhaften Färbung unterseits doch auf Grund der rein weissen Bauchmitte für *cantillans* erklären. Er stimmt ganz überein mit einem ♂ des B.M. aus Corsica, v. Zur Sicherheit sandte ich den Vogel an Dr. Hartert, der ihn zusammen mit Hilgert in Ingelheim verglich und mir freundlichst seine Diagnose mitteilte, welche auf

“*cantillans*” lautet. Ich betone noch ausdrücklich, dass es sich weder um einen jungen, noch gar in der Entwicklung zurückgebliebenen Vogel, sondern offenbar um ein recht altes, im Gefieder schönes ♂ handelt.

### 31. *Agrobates galactodes galactodes* (Temm.).

Rothschild und Hartert, *Nov. Zool.* p. 510.

Während Hartert die Heckennachtigall für einen Gast in der algerischen Wüste hielt, muss ich nach dem neuesten Befunde sie mit grosser Wahrscheinlichkeit als **Brutvogel** mindestens in der Oase Ouargla bezeichnen. Dort fand Spatz Anfang Mai viele eifrig singende ♂♂, deren Testikeln stark geschwollen waren; bei der Rückreise in der ersten Hälfte Juli hatte die Zahl der Vögel anscheinend nicht abgenommen, nur der Gesang war fast ganz verstummt. An beiden Zeitpunkten wurden Belegexemplare gesammelt, welche ich von Brutvögeln in Nord-Tunesien, deren ich einige 30 Stück besitze, nicht zu unterscheiden vermag.

### 32. *Scotocerca inquieta saharae* (Loche).

Rothschild und Hartert, *Nov. Zool.* p. 510.

Es ist eine ganz bestimmte Formation, welche der Wüstenschlüpfer bewohnt, sei es in Tunesien bis hinauf ins Gebiet ii. (v. Erlanger), sei es im Süden Algeriens: die Sebka. Das ist ein Chott en miniature, eine Bodensenkung bestehend aus stark salzhaltigem Lehm, am Rande meist umgeben von niederen salzverkrusteten Büschen. Ob dann in der weiteren Umgebung sich steinige Hammada oder kleine Sanddünen erheben, scheint für unser Vögelchen belanglos zu sein. Zwischen hohen Dünen wurde es nicht gefunden, mir liegen hier 2 Exemplare vor:

♂, 5. v., Sebka Ngoussa, 20 Klm. nördlich Ouargla.

♂, 13. vii., Hassi bon-Chesana.

Letzteres im sehr abgenützten Kleide zeigt eine viel hellere Oberseite als alle Bälge des Berliner Museums. Es ist interessant, an ihm beobachten zu können, wie stark die Sahara-Sonne mit der Zeit ein an sich schon blasses Gefieder noch ausbleicht.

### 33. *Cisticola cisticola arquata* (Müll.).

Rothschild und Hartert, *Nov. Zool.* p. 511.

In diesem Falle liegen leider keine Belegstücke vor. Der Cistensänger wurde ausschliesslich bei Biskra Ende April in Weizenfeldern beobachtet, welche man nicht betreten durfte. Nach Jahreszeit und Fundort ist mit allergrösster Wahrscheinlichkeit anzunehmen, dass es sich hier um die in Nord-Afrika brütende Form, nicht aber um den in Europa heimischen Vogel handelte.

### 34. *Crateropus fulvus fulvus* (Desf.).

Rothschild und Hartert, *Nov. Zool.* p. 511.

Weit hinein in die Wüste erstreckt sich die Verbreitung nicht, wenigstens nicht während der Brutzeit. Auf der Hinreise wurden noch kleine Trupps zwischen Touggourt und Ouargla hie und da angetroffen, weiter südlich scheint diese Drossel aber in der Sanddünen-Wüste nicht mehr vorzukommen. Im allgemeinen dürfte sie sich in ihrer Verbreitung an das Vorhandensein hoher Dornbüsche, besonders Zizyphus, binden, könnte also anderswo unter anderen Verhältnissen, z. B. in der Steinwüste, auch noch weiter nach Süden vordringen,

35. *Saxicola (Oenanthe) oenanthe oenanthe* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 513.

Die normale Zeit des Durchzuges fällt in die zweite Hälfte März und den April. Aber noch später sind durchziehende Vertreter der typischen *oenanthe* keine grosse Seltenheit. Schon früher erhielt ich aus dem Norden Tunesiens mehrere alte im Mai erlegte Stücke, jetzt kommen noch 3 weitere hinzu: ♂ ♀ ♀, 9–15–20. v. Ouargla bezw. Chott. Keins derselben gehört der grossflügeligen Form *leucorhoa* Gm. an.

36. *Saxicola (Oenanthe) deserti homochroa* Tristr.

Rothschild und Hartert, *Nov. Zool.* p. 515.

Wegen der Systematik verweise ich auf Harterts ausführliche Besprechung der verwandten Formen. Spatz sah diesen Steinschmätzer mehrfach und sammelte ♂ ad. 5. v. Nguoussa sowie ♂ juv. 26. vii. Bordj Chegga. Dieses Stück ist in einem Stadium, welches man nicht häufig bei dieser Art zu Gesicht bekommt, in der Mauer vom kolossal abgenützten und verblassten Jugendkleide zum ersten Alterskleide. Auf der Oberseite sind daher alle möglichen braunen, gelblichen und sandfarbenen Schattierungen gemischt, die Unterseite ist vorwiegend weisslich mit einigen rostfarbenen Federn am Kropfe und dem Beginn eines schwarzen Kehlfleckes.

37. *Saxicola (Oenanthe) hispanica hispanica* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 516.

Von diesem Durchzügler findet sich hie und da ein Spätling noch im Mai, so ♂ 11. v., Ouargla, weisskehlig. Im Norden Algeriens brütet diese Art.

38. *Saxicola (Oenanthe) leucopyga aegra* Hart.

Rothschild und Hartert, *Nov. Zool.* p. 518, und antea.

Mit der Systematik und der Frage, ob nicht Unterformen sich mit Fug und Recht aufstellen liessen, habe ich mich bereits gelegentlich meiner Arbeit über Sinai-Vögel (*J. f. O.* 1912. iv. p. 559) beschäftigt, ich möchte davon hier nichts wiederholen.

Dr. Hartert sammelte dies Jahr im Innern der Sahara eine Serie, die ihm genügte, die algerische Form auf Grund ihrer geringeren Dimensionen abzutrennen. Ich verweise auf seine Ausführungen und beschränke mich darauf, meine Stücke zu beschreiben:

1. ♀ ad. 22. vi. Hassi Melah. Fllg. 94 mm., Kopfplatte schwarz mit einigen weissen Federchen, deutliche **grosse** schwarze Flecke auf **allen** Steuerfedern.
2. ♂ ad. Haoud-Sita, östlich Ouargla, peträische Sahara. Fllg. 105 mm., Handschwingen werden gerade vermausert, grosse weisse Kopfplatte **ganz weiss**.
3. ♂ juv. Haoud-Sita, wie voriger am 30. vi. Fllg. 100 mm., Kopfplatte schwarz, auf beiden äusseren Steuerfedern kleine schwarze Flecke.

Ausserdem wurden in derselben Gegend noch einige Exemplare geschossen aber verloren, da jeder Vogel, der nur noch eine Spur von Leben fühlt, sich mit grossem Geschick zwischen Steinen oder in Löchern so zu verkriechen weiss, dass man ihn nicht wiederfindet.

39. *Pratincola (Saxicola) rubetra spatzi* Erl.

Rothschild und Hartert, *Nov. Zool.* p. 519.

Es konnten folgende Stücke gesammelt werden :

3 ♂♂, 23. iv., Biskra.

♀, 5. v., Nguoussa.

♂, 9. v., Ouargla.

♀♀, 15-22. v., Ouargla.

Alle Vögel möchte ich auf Grund ihrer hellen Färbung zur Form "spatzi" ziehen. Ich glaube, dass es sich um durchziehende Gäste, nicht um Brutvögel handelt, da Anfangs mehr ♂♂, zuletzt mehr ♀♀ festgestellt wurden. Im ganzen war der Wiesenschmätzer nicht häufig.

40. *Hirundo (Chelidon) rustica rustica* L.

Rothschild und Hartert, *Nov. Zool.* p. 521.

Die in den Atlasländern brütende Rauchschnalbe ist bisher nicht abgetrennt worden, weil es nicht feststeht, ob sie konstant in den Massen kleiner ist als die europäische. Meine 3 Exemplare, ♀ 30. iv. Touggourt, ♂♂ 17-19. v. Ouargla, haben das Flügelmass von 120, 122, 123 mm.

Interessant ist, dass von den bei Ouargla geschossenen ♂♂ das eine reinweisse, das andere bräunlich überlaufene Unterseite zeigt und sich damit dem Färbungscharakter von "savignyi" aus Egypten nähert. In meiner Sammlung besitze ich übrigens mehrere Sommer- (also wohl Brut-) Vögel aus Nord-Tunesien mit gleichfalls lebhaft gefärbter Unterseite.

41. *Chelidon (Hirundo) urbica urbica* (L.).

Bei Ouargla sammelte Spatz 7 ♂♂, 2 ♀♀ vom 14-19. v. Alle zeigen **grosse** Flügelmasse, 108-114 mm., sind also typische *urbica* und keine *meridionalis* mit 98-106 mm. Dr. Hartert hatte die Liebenswürdigkeit, die Serie zu untersuchen, und konnte meinen Befund bestätigen. Dies ist um so interessanter, als er selbst nach dem Wortlaut seiner Veröffentlichung in den Frühjahrsmonaten anscheinend **nur** *meridionalis* gefunden hat. Ich vermute nach Analogie anderer Arten, z. B. *Saxicola oenanthe*, dass diese so spät durchwandernden Mehlschnalben eine weit im Norden liegende Brutheimat haben dürften, vielleicht ganz hoch hinauf im schwedischen Lappland, wo ich Ende Juni 1912 an den wenigen Blockhäusern einer finnischen Ansiedlung am Torne Träsk-See über 100 Brutpaare konstatierte.

42. *Riparia riparia riparia* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 522.

Die nach Hartert im März und April häufig durchziehende Uferschnalbe wurde auch noch am 16-17. v., bei Ouargla gesammelt (♂♂). Beides sind typische *riparia* mit grossem Flügelmass : 106, 108 mm., nicht etwa *littoralis* aus Egypten, deren Flügel nur 90-97 mm. messen.

43. *Apus murinus brehmorum* Hart.

Rothschild und Hartert, *Nov. Zool.* p. 523.

Der fahle Segler wurde von Hartert als Brutvögel in Nord-Algerien festgestellt, im Süden aber für einen Durchzügler gehalten. Nach Spatz'neuesten

Beobachtungen brütet er jedoch so gut wie sicher noch weit im Süden bereits in der eigentlichen Wüste und zwar recht zahlreich. Zunächst muss der Gara Krifa südlich Ouargla als beliebter Brutplatz gelten, dort beobachtete Spatz am 10. v. eine Reihe von Pärchen, welche sich jagten und häufig in die Felsspalten schlüpfen. Er sammelte dabei 2 ♂♂, 3 ♀♀ mit stark entwickelten Genitalien. Kurz darauf, vom 14–21. v., sah er täglich an lichten Stellen der Oase Ouargla eine Menge Segler zu bestimmten Tagesstunden kreisen, und zwar erschienen sie recht pünktlich Nachmittags zwischen 4 und 5 Uhr. Genau die entsprechende Beobachtung habe ich Mitte April 1911 bei Firan im Sinai gemacht, auch dort erschienen die in den umliegenden Felshängen wohl sicher brütenden Segler stets Nachmittags zur selben Stunde und kreisten einige Zeit am Rande der Oase (*J. f. O.* 1912, p. 359). Während des Mai wurden bei Ouargla noch 4 ♂♂, 5 ♀♀ erbeutet.

Alle diese Bewohner der Wüste vermag ich in ihrem Äusseren absolut nicht von einer grösseren Suite in meiner Sammlung zu unterscheiden, welche fern vom Norden aus der Stadt Tunis stammt.

#### 44. *Caprimulgus aegyptius saharae* Erl.

Rothschild und Hartert, *Nov. Zool.* p. 524.

Nur am frühen Morgen des 18. vii., bei Bled-el-Ahmar sah Spatz ein Exemplar, das auf wenige Meter an ihm vorbeistrich, sodass er es deutlich erkannte. Später um Ende Juli und Anfang August beobachtete er bei Biskra häufiger Ziegenmelker während der Abenddämmerung, doch war die Entfernung zu gross, um sie genau ansprechen zu können, und schiessen durfte man dort nicht.

#### 45. *Merops apiaster* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 524.

Der gemeine Bienenfresser erscheint auf dem Frühjahrszuge ziemlich spät, noch am 21. iv. wurde ein Flug beobachtet, welcher in beträchtlicher Höhe über Biskra wegstrich.

#### 46. *Merops persicus chrysocercus* Cab. Heine.

Rothschild und Hartert, *Nov. Zool.* p. 524.

Wegen systematischer und nomenklatorischer Fragen verweise ich auf Rothschild und Hartert, die auf Tafel ix. auch eine schöne Abbildung der Formen *persicus* und *chrysocercus (saharae* Neum.) bringen.

Vom grossen grünen Bienenfresser wurden 2 ♂♂, 2 ♀♀, am 25. iv. etwa 25 Klm. nördlich Tonggourt an der Strasse gesammelt, wo sie auf den Telegrafendrähten sich herumtrieben. Anscheinend befanden sich die Vögel auf dem Zuge. Weiter südlich wurde keiner mehr gesehen.

#### 47. *Upupa epops epops* L.

Rothschild und Hartert, *Nov. Zool.* p. 525.

Hartert hat in seinen Arbeiten (*V. d. p. F.* p. 867. und *Nov. Zool.* 1912) den Namen "*pallida* Erl." für nordafrikanische Vögel wieder eingezogen, eine Massnahme, welche ich schon *J. f. O.* 1909, p. 197 bei Besprechung meiner tunesischen Ausbeute empfohlen hatte.

In den Oasen der algerischen Wüste war im Mai bis Juli der Wiedehopf keine ganz seltene Erscheinung, er dürfte dort vereinzelt brüten. Ein ♂ ad. wurde am 9. v. in Onargla gesammelt.

#### 48. *Bubo bubo desertorum* Erl.

Vergl. Rothschild und Hartert, *Nov. Zool.* p. 527, sub *B. b. ascalaphus*.

Es gehört Glück dazu, um diesen im Süden offenbar besonders lokal auftretenden Vogel anzutreffen. Das beweist schon der Umstand, dass es zwei so erfahrenen und umsichtigen Sammlern wie Hartert und Hilgert nicht gelungen ist, das Glück lässt sich eben nicht zwingen! Spatz fand am 10. v. am Berge Gara Krima 12 Klm. südlich Onargla ein Nest mit 2 eben flüggen Jungen. Eins davon wurde gefangen, das andre entkam, da Spatz es nicht schießen wollte und der Vogel in dem sehr unübersichtlichen Gelände schliesslich doch trotz seines geringen Flugvermögens sich zu salvieren wusste. Am 27. v. wurden beim Absuchen kleiner Steinhügel unfern von Hassi Medjira 2 ziemlich erwachsene Junge hochgemacht, von denen aber gleichfalls nur eins erlegt werden konnte. Es befindet sich jetzt in meiner Sammlung, das lebende Stück ist in Onargla während Spatz' Abwesenheit im Süden leider an mangelnder Pflege eingegangen und natürlich dann auch nicht als Balg erhalten worden.

Ich besitze noch 2 Vögel ad. aus den Bergen bei Gafsa, und glaube bis auf weiteres noch an die Berechtigung der von Erlanger benannten Wüstenform.

#### 49. *Scops (Otus) scops scops* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 530.

Rothschild und Hartert zogen die Form *O. s. erlangeri* Tschusi wieder ein, ich vermag die Frage nicht nachzuprüfen, doch muss ich mich zunächst dieser Auffassung anschliessen im Vertrauen auf das verhältnismässig reichhaltige Material, welches den Autoren vorgelegen und zur Bildung ihres Urteils geführt hat. Wenn Hartert ferner als Genusnamen "*Otus*" wieder einführt, so wage ich keinen Moment an der formellen Berechtigung auf Grund der jetzt noch bestehenden Regeln zu zweifeln, behalte aber daneben doch noch den alten Namen bei, um Verwechslungen möglichst zu vermeiden, wie ich es auch sonst oft getan habe z. B. bei "*Saxicola*."

Das mir vorliegende Stück, ♂ 17. vii. Bled-el-Ahmar, ist **kein** ganz junges, muss aber nach dem Termin der Erlegung als Brutvogel der Gegend angesprochen werden. Die Oberseite ist auffallend durch den fast rein grauen Grundton ohne Beimischung von gelb oder rostbraun. Die bei Gabès früher von Spatz gesammelten Stücke des Berliner Museums zeigen hierin den denkbar grössten Gegensatz dazu, ihre Oberseite ist sehr stark mit sandfarbenen und rostgelblichen Tönen vermischt. Am meisten gleicht mein Exemplar in der **Oberseite** einem Balg des B. M. aus Rumänien, doch ist dies ein **junger** Vogel, wie die Zeichnung der **Unterseite** sofort beweist, die Ähnlichkeit also, wenn man so sagen darf, eine "zufällige." Jedenfalls ist dies ein neuer Beweis dafür, dass die Frage der lokalen Formen bei der Zwergohreule mit zu den allerschwierigsten gehört.

Wohl in allen Oasen des Südens hört man im Laufe schöner Nächte den Glockenruf dieser niedlichen Eule erschallen, doch ist es dann meist zu dunkel, um sie in den Palmenkronen zu erkennen. Bei Tage aber findet man den kleinen grauen Federklumpen, der unbeweglich dicht an den Stamm gepresst sitzt, nur durch einen besonders glücklichen Zufall.

50. **Vultur monachus** L.

Die erste Kunde von einem grossen braunen Geier, der im Innern der Wüste auf Sträuchern horstet, brachte Spatz von seiner Tour in die Tunesische Sahara 1898. Als handgreiflichen Beweis konnte er 4 Gelege à 1 Ei vom. 7–20. iii. 98 vorlegen, welche sich heute in der Coll. v. Erlanger befinden (*Cat. Hilgert*, p. 509). Ein vom eingeborenen Jäger erlegter Vogel war leider verdorben. Die Horste waren so gross, dass zwei schwächliche Eingeborene zusammen darin Platz hatten, und wurden gleichzeitig vom *Passer simplex saharae* bewohnt: sie standen auf starken Dornbüschen in den Tälern zwischen hohen Sanddünen.

Auf seiner letzten Reise fand Spatz leider keine Horste, dieselben wären so spät im Jahre auch vielleicht schon verlassen gewesen. Einen alten Vogel sah er Anfang Juni auf den Dünen bei Ain Taïba, konnte aber leider nicht zu Schuss kommen. Eine Verwechslung mit einer gemeineren Art, etwa einem jungen Neophron, ist positiv ausgeschlossen. Hoffentlich gelingt es demnächst, dieses mysteriösen Wüstengeiers endlich in persona habhaft zu werden!

51. **Buteo ferox cirtensis** Lev.

Rothschild und Hartert, *Nor. Zool.* p. 535.

Mit systematischen Fragen brauche ich mich nach Harterts ausführlichen Darlegungen nicht mehr aufzuhalten, ich bin heute, wie schon seit Jahren, in bezug auf die Buteo-Gruppen vollkommen seiner Ansicht.

Der Wüstenbussard geht als Brutvogel tief hinein in die Sahara, einen fast flüggen jungen Vogel brachten die Eingeborenen in Ouargla Mitte Mai lebend, leider ging er mit dem jungen Uhu zusammen ein, während Spatz im Süden bei Ain Taïba weilte.

52. **Circaëtus gallicus** Gm.

Rothschild und Hartert, *Nor. Zool.* p. 537.

In der Wüste südlich Biskra gehört der Schlangennadler zu den selteneren Erscheinungen. Spatz konnte ein ♀ ad. untersuchen, welches Touristen bei M'raïer zwischen Biskra und Tonggourt erlegt hatten. Auf derselben Strecke sah er ein lebendes Exemplar auf einer Telegrafenfange nahe einer Wasserstelle blocken.

53. **Milvus korschun korschun** (Gm.).

Rothschild und Hartert, *Nor. Zool.* p. 536.

Obengenannte Autoren vereinigten den braunen Milan der Atlasländer wieder mit der europäischen Form, ziehen also "*reichenoui* Erl." ein.

Der Vogel ist weit verbreitet vom Norden der Atlasländer bis zu den Oasen des Südens, selbst bei Ain Taïba mitten in den grossen Sanddünen sah Spatz noch ein Exemplar.

54. **Cerchneis tinnuncula tinnuncula** (L.).

Rothschild und Hartert, *Nor. Zool.* p. 538: *Falco tinnunculus*.

Bei der grossen Neigung zu individueller Variation ist die Frage immer noch offen, ob der nordafrikanische Turmfalke eine unterscheidbare Form bildet. Er kommt auch im Sommer noch sehr weit im Süden vor, wie ♀ ad. vom 5. vi. Ain Taïba beweist. Die Färbung dieses Stückes ist ziemlich blass, doch besitze ich ähnlich gefärbte Vögel aus fast allen Gegenden, wo ich längere Suiten sammeln konnte.

55. *Falco biarmicus erlangeri* Klschdt.

Rothschild und Hartert, *Nov. Zool.* p. 538.

Dieser Edelfalke scheint in der eigentlichen Wüste seltener zu sein als in den Wänden des Atlas oder an der Küste von Tunesien bezw. Marokkos. Spatz beobachtete nur bei Ain Taïba einen alten Vogel zu Anfang Juni; wenige Tage später am 18. vi. erhielt er bei Hassi Tebonb ein Junges lebend, das leider auf dem Rückmarsche infolge übergrosser Hitze kurz vor Toresschluss einging.

56. *Ardetta minuta* (L.).

Rothschild und Hartert, *Nov. Zool.* p. 543.

In der Oase Ghott, einer sehr wasserreichen Anlage neueren Datums östlich Ouargla, wurden am 20. v. ♂ ♂ gesammelt, am 22. v. kam in Ouargla noch ♀ hinzu. Schon Loche (*Hist. nat. Ois.* 1867. ii. p. 139) und v. Erlanger (*J. f. O.* 1900 p. 39) stellten die Zwerg-Rohrdommel als Brutvogel in den Oasen der Atlasländer fest, v. Erlanger sogar an 3 Stellen: Gafsa, Nefta, Tozeur. Ich selbst sammelte einen Vogel ad. im Mai 1905 (*J. f. O.* 1909 p. 284) dicht bei Gabès, wo er gleichfalls brüten dürfte. Nach den Ende Mai gesammelten Stücken ist mit hoher Wahrscheinlichkeit anzunehmen, dass das Brutgebiet sich südwärts bis Ouargla erstreckt.

57. *Phoenicopterus roseus* Pall.

Rothschild und Hartert, *Nov. Zool.* p. 541.

Der Flamingo schreckt nicht vor gelegentlichen Ausflügen in die eigentliche Wüste zurück. Schon Rothschild und Hartert fanden ihn bei Tamerna zwischen Biskra und Touggourt, Spatz bekam noch in Touggourt einen alten Vogel in die Hand, welchem die Telegrafaleitung dort zum Verhängnis geworden war.

58. *Turtur (Streptopelia) turtur arenicola* Hart.

Rothschild und Hartert, *Nov. Zool.* p. 543.

Die Autoren weisen hier in den *Nov. Zool.* nochmals auf die Unterschiede hin, welche *T. t. arenicola* als gute Form charakterisieren, trotz aller individuellen Variabilität.

Als Brutvogel hat sie anscheinend eine sehr weite Verbreitung von Persien bis zu den Atlasländern, hier brütet sie nach Rothschild und Hartert vom äussersten Norden bis zu den Oasen tief in der Wüste (Ghardaïa). Ich besitze aus dem Süden folgende Suite:

- ♀ ad. Bled-el-Ahmar, 1. v.
- 4 ♂ ♂, 4 ♀ ♀ ad. Ouargla, 8–16. v.
- ♀ ad., ♀ juv. Ouargla, 8. vii.
- ♂ ♂ ad. Ouargla, 10. vii.
- ♂ ♂ ♀ juv. Bled-el-Ahmar, 17. vii.

Besonders in der Oase Ouargla ist die Turteltanbe ein recht häufiger Brutvogel, doch schreitet sie dort offenbar später im Jahre zur Fortpflanzung als die neben ihr vorkommende *T. senegalensis aegyptiacus*. Im Mai fand Spatz trotz besonderer Aufmerksamkeit noch keine flüggen Jungen, selbst die im Juli gesammelten juv. sind z. T. noch nicht ausgewachsen.



59. **Turtur (Streptopelia) senegalensis aegyptiacus** Lath.

Rothschild und Hartert, *Nov. Zool.* p. 543.

Im Gegensatz zur vorigen kommt diese Taube nur südlich des Atlases vor, dort aber in den Oasen der Wüste als recht häufiger Standvogel. Ich besitze aus Ouargla 5 ♂♂, 2 ♀♀ ad. vom 9-21. v. sowie ♂ juv. 9. v., dann aus dem Juli noch 2 ♂♂, 2 ♀♀ ad. und 2 ♂♂ juv.

Diese Art brütet früher als die vorige: Hartert fand schon Eier im März—April, flugbare Junge im April, im Mai sah Spatz vollkommen erwachsene Junge.

60. **Pterocles arenarius** Pall.

Rothschild und Hartert, *Nov. Zool.* p. 543.

Dieses Flughuhn dürfte nicht weit in die Wüste vordringen. Anfang August erhielt Spatz aus der Umgebung von Biskra ein knapp halbwüchsiges Junges, das er einige Tage lebend hielt, bis es einging und für mich gebalgt wurde. Beobachtungen von südlicheren Punkten liegen nicht vor.

61. **Pterocles alchata alchata** (L.).

Rothschild und Hartert, *Nov. Zool.* p. 544.

Ähnlich wie bei *arenarius* ist die Heimat dieses Flughuhns nicht in der echten Sandwüste zu suchen, wenn es auch an geeigneten Stellen südlich des Atlas nicht selten zu sein scheint. In Biskra erhielt Spatz im August ein lebendes Junges, welches bis heute im Berliner Zoo sich besten Wohlseins erfreut.

62. **Pterocles coronatus** Licht.

Rothschild und Hartert, *Nov. Zool.* p. 544, bei *P. s. senegallus*.

Hartert hat diese Art, die nach v. Erlanger am meisten südlich in den Atlasländern vordringt (vgl. *J. f. O.* 1900 p. 31-4), nur bei M'raïr und Ghardaïa gesehen bezw. an der Stimme erkannt, jedoch nicht erlegt. An der Oase Chott beobachtete Spatz fast täglich im Mai wie im Juli kleine Flügel, doch fielen die scheuen Vögel leider nie am Wasser ein, weil dort stets gearbeitet wurde. Spatz kennt den verschiedenartig klingenden Lockton der nordafrikanischen Pterociden aus langjähriger Erfahrung wie wenige andere Europäer und versichert, dass an dieser Stelle ausschliesslich *P. coronatus* erschien, dieses aber regelmässig.

63. **Caccabis petrosa spatzi** Rehw.

Rothschild und Hartert, *Nov. Zool.* p. 544.

Dies Huhn ist nicht eigentlich ein Wüstenbewohner, soweit die sandigen Regionen in Frage kommen, doch fand Koenig es auf dem steuigen Plateau des M'zab noch ziemlich weit südlich am Oued N'ca. Spatz brachte 2 schon gut entwickelte Junge, welche er Anfang August in Biskra bekam, dem Berliner Zoo mit, wo sie sich anscheinend durchaus wohl befinden.

64. **Cursorius gallicus gallicus** (Gm.).

Rothschild und Hartert, *Nov. Zool.* p. 548.

Der Wüstenläufer wurde auf der ganzen Strecke Biskra—Touggourt—Ouargla fast täglich beobachtet, hingegen scheint er südlich von Ouargla im Gebiet der hohen Dünen nicht mehr oder doch nur ganz vereinzelt vorzukommen.

65. *Machetes pugnax* (L.).

Rothschild und Hartert, *Nor. Zool.* p. 549.

Es wurde ♂ am 22. v. in der Oase Ouargla an einem seichten Wassergraben erlegt. Das Stück ist noch nicht fertig mit der Anlegung seines bunten Sommerkleides, nur vereinzelt finden sich schwarze und violett glänzende Federchen an den Hals- bzw. Kropfseiten als Anfang des Kragens. Gerade der Kampfläufer scheint sich auf dem Frühjahrszuge gern Zeit zu lassen, ich erlegte auch in Tunesien noch ein ♀ ad. am 11. v. 1905 (vgl. *J. f. O.* 1909 p. 313).

Ausser diesen beiden Vögeln wurden von den so artenreichen Familien der Schnepfen und Regenpfeifer keine weiteren Vertreter zweifellos festgestellt. Spatz glaubt, noch *Tringoides hypoleucus* bei Ouargla gesehen zu haben. Bei Vergleich mit den vielen Arten, welche Hartert und Hilgert im März—April fanden, beweist dieser Befund, dass es sich hierbei fast durchweg um Durchzügler handelt. Selbst *Charadrius alexandrinus* und *dubius*, von denen letzterer sicher, ersterer wahrscheinlich schon unfern des Wüstenrandes brütet, wurden während des Sommers im Innern der Sahara von Spatz nicht gefunden.

Meine Liste ist zu Ende. Bei der Kürze des Aufsatzes ist eine Rekapitulation der gemachten Beobachtungen jetzt am Schlusse wohl überflüssig. Nur auf einen Punkt möchte ich nochmals recht deutlich hinweisen: Es ist an einer grossen Zahl von Fällen nachgewiesen, dass einzelne weder kranke, noch besonders junge Exemplare unserer heimischen, europäischen Vogelarten noch spät im Frühjahr oder selbst im Sommer in der Sahara zu finden sind. Es ist also **nicht eine Ausnahme sondern Regel**, dass einzelne europäische Brutvögel noch während der normalen Brutzeit sich in Nordafrika aufhalten, sei es als sehr verspätete Durchzügler, sei es als dort bleibende Sommergäste. Mir erscheint fast sicher, dass ein grosser Teil dieser Spätlinge, obgleich körperlich gesund, in dem betreffenden Jahre nicht zur Brut schreitet. Es ist dies ein neuer Beweis für die Richtigkeit meiner Theorie, welche ich seit Jahren verfechte (*J. f. O.* 1908 p. 480, und Intern. Ornith. Kongress Berlin 1910), dass ein weit grösserer Teil der erwachsenen und gesunden Vogelwelt als man bisher anzunehmen geneigt war aus den verschiedensten äusseren Gründen gelegentlich ein Jahr nicht zur Brut schreitet.

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DESCRIPTIONS OF TWO NEW *COLIAS* AND SOME  
AFRICAN *SYNTOMIDAE*.

By WALTER ROTHSCHILD, F.R.S., PH.D.

*Colias mossi* sp. nov.

This is a most extraordinary discovery, as the species is unlike any other American *Colias*. It is hardly distinguishable above from *Colias cocandica tamerlana* Stdgr., though abundantly distinct below.

♂. Antennae chocolate-brown tinged with rose-colour; head and thorax pale olive-green, hinder half of thorax with a mixture of long white hairs; abdomen pale olive-green, basal third clothed with white hairs.—Forewing olive-black, basal two-thirds strongly and densely clothed with pale olive-green scales; stigma black, base of costa rose, fringe whitish green, a submarginal row of pale olive-green oblong streaks.—Hindwing olive-black powdered with pale olive-green scales; abdominal area, fringe, and submarginal streaks pale yellowish green; stigma yellowish.

Underside: forewing bluish grey, slightly powdered with apple-green scales, apical fourth apple-green; hindwing apple-green washed with verdigris-green, stigma white.

Length of forewing: 24 mm.

*Hab.* 1 ♂, San Marco, Peru, 3200 metres=12,480 ft., November 22, 1900, rainy season (Simons), type; 1 ♂, Oroya railway, Peru (Rev. A. M. Moss).

*Colias euxanthe alticola* ♀-ab. *virescens* ab. nov.

♀. Olive-black, densely clothed with pale olive-green scales and hairs.

*Hab.* Tirapata, Carabaya, S.E. Peru, 12,700 ft., January—February 1901 (G. R. Ockenden).

This aberration resembles *nastes* in colour. All intergradations between *virescens* and normal white or orange ♀♀ were taken by Mr. Ockenden.

**SYNTOMIDAE.**

*Metarctia postrosea* sp. nov.

♂♀. Differs from *lutea* Holl. in the more buff ground of forewings and in the intra-neural spaces being mostly filled up with chocolate-grey. Hindwing pale carmine, **not** orange-buff. Body and antennae orange-buff, **not** ochraceous orange.

Length of forewing: ♂ 15.5 mm.; ♀ 19 mm.

*Hab.* Near Lagos, Oni Camp, April 25, 1912 (W. A. Lamborn). Type, ♂.

*Metarctia aurantiifusca* sp. nov.

♀. Allied to *flaviceps* Hmps.

Ground colour ochraceous golden orange; nervures of both wings, fringes, and some intra-neural spaces fuscous sooty black.

Length of forewing: 18 mm.

*Hab.* Lagos, March 5, 1912 (W. A. Lamborn).

**Apisa lamborni** sp. nov.

♂. Entirely purplish sooty black with four semihyaline whitish spots on forewing, one on hindwing.

Length of forewing : 12 mm.

*Hab.* Lagos, March 15, 1912 (W. A. Lamborn).

SOME NOTES ON THE GENERA *ZAGLOSSUS* AND  
*TACHYGLOSSUS*.

BY THE HON. WALTER ROTHSCHILD, Ph.D., F.R.S.

WHEN I wrote the short note on *Zaglossus* in *The Field*, December 1912, I had not read Mr. Glover Allan's article in the *Harvard College Memoirs of the Museum of Comparative Zoology* vol. xl, No. 5, though Mr. Oldfield Thomas had informed me of its main contentions. Now having studied it carefully, I find that, though my note in *The Field* requires much explanation and amplification, I cannot agree with Mr. Allan's conclusions that the differences of pelage and spines are due solely to age and season, and are not racial.

In these notes I shall deal entirely with external characters and distribution, leaving a comparative anatomical description till we have fresh or alcoholic material of each form for comparison.

When in 1885 Mr. Oldfield Thomas published his exhaustive review of *Echidna* (*P.Z.S.* 1885, pp. 329-39), modern methods of **Systematic** work had not generally been applied to the Mammalia, and I am sure that he would be the first to acknowledge that we have progressed far beyond the standpoint adopted by him in that article.

In 1905, induced by Dr. K. Toldt's paper published in Vienna (*Verh. K.K. Zoologisch-bot. Gesellschaft* 1905, pp. 5-11) I gave a review of *Zaglossus*; but since then, apart from Mr. Allan's paper, we have learnt much, and the culminating point has been reached by the arrival in Europe of eight living *Zaglossus*, all from a single locality. Before going into the question of the various races of *Zaglossus* a summary of the external characters of the specimens at Harvard which led Mr. Allan to his conclusions are given. A specimen from Mount Arfak (in spirit) is dark brown, deepening on back, spines black with white tips large, fur thick and woolly. Two from Fak Fak : (1) very old, spines mostly white, but a few grey, very flat, hair and spines thinly scattered, colour pale buffy on head, rest blackish brown ; (2) spines large, stout, white, and thickly set, hair thick, coarse brown. Two from Sorong, hair long, thick, coal-black with paler bases, spines dark horn to black. One from Arfak, pelage thick and woolly, spines short. From these facts, at first sight, Mr. Allan's statement that his eight specimens prove that these differences are due to age, season, and possibly sex, would be accepted; but I think the facts that I am bringing forward will tend to disprove it.

However elementary it may appear, I would like to remind my readers that there are numerous degrees of variation, for, while in one species of animal the

local races are well defined, and only overlap at the junctures of their areas of distribution, other creatures in certain portions of their range have developed into races which are clearly defined, while in other portions of their area the factors determining variation seem to be of an indeterminate character, and consequently we find individuals representing all the forms as well as some with mixed characters occurring in one and the same locality; so that we find a subspecies or local race occurring as such in one place, while in another it occurs only as an aberration.

Of Mr. Allan's specimens the Fak Fak ones were bought from natives by the collector, and have an element of doubt as to the place of origin. Sorong is on the south-west portion of Arfak Peninsula, and would be most likely to have more in common with the fauna of the Onin Peninsula, MacCluer's Inlet, etc., than with the fauna of the somewhat isolated Mount Arfak. The first fact I have to bring forward in refutation of Mr. Allan's statements is that we now know of five recent specimens from east of the Fly River, three from German and two from British New Guinea, and they are all identical and are undoubtedly *Zaglossus bruijni bartoni* Thos. On the other hand, the eight living specimens from Kaimana, Charles Louis Mountains, consist of two specimens agreeing with *Z. b. bartoni*, two or three agreeing with *Z. b. nigroaculeata* Rothsch., and the rest being intermediate. This, however, is not wonderful, because although I originally gave the locality of my type of *Z. b. nigroaculeata* as Charles Louis Mountains, I never had definite proof beyond a live-stock dealer's word, and I have from other evidence reason to believe it came from near Sorong. If this were so, Kaimana would be on the border-line between the areas of *Z. b. nigroaculeata* and *Z. b. bartoni*. If the Fak Fak specimens are really from there, we should again have specimens intergrading on the one hand with *Z. b. bruijni* and on the other with *Z. b. nigroaculeata* and *Z. b. goodfellowi* of Salwatty, and this in an intermediate area. The only difficulty which in my mind could arise concerns *Z. b. bruijni* and *Z. b. villosissima*, for we undoubtedly find specimens which have come from Mount Arfak and yet have the extra thick fur and shorter spines which are characteristic of *villosissima*. However, the fact remains that the three more recent specimens of *villosissima* at Tring are all pale brown—almost cinnamon—all over, with whitish heads, while all the Arfak specimens have the dark, blackish brown fur and paler brown heads characteristic of *Z. b. bruijni*. The above-mentioned three *villosissima* were sent over in the last collection received from A. Bruijn, which I bought in 1890 or 1891. In this collection were large numbers of birds and mammals from the islands in, and shores of, Geelvink Bay, and I have little reason to doubt that these three *Zaglossus* were also collected by Bruijn's hunters somewhere on the eastern shores of Geelvink Bay. The specimens at Tring of *Z. b. nigroaculeata* consist of the very large and aged type specimen, a fair-sized one apparently adult, and a young one about three-fifths of the size of the type—i.e. about the size of *Tachyglossus aculeatus lawesi*. The small one has the black, flat spines and sparse, long, coal-black hair of the type, thus proving that the nature of the pelage is **not** a question of age.

At Tring there are three *Z. b. goodfellowi*, and also two *Z. b. bartoni* from German New Guinea, and I have examined these, the two from Kaimana now alive in the London Zoological Gardens, as well as a young Kaimana specimen which was sent me in the flesh. The two living animals are fully adult, and very large, the bigger one measuring from tip of tail over curve of back to tip of snout more

than 1000 mm. ; they have sparse black hair and white spines, while the young one has black spines. I think it may turn out that in all the races the one sex has thicker, more woolly fur than the other; but although we know now of about fifty or sixty specimens, we have not got sufficient specimens sexed in the flesh and with sufficient other data to decide this question.

Finally, although none of my *Z. b. goodfellowi* are black-haired, but seal-brown, and also differ inter se in that the one has the head paler than the back, while the two others have the head and back uniform, they agree with the type in being strongly spined on the belly. The difference from the type in colour is either sexual or these specimens are from a different locality. Mr. Allan states that the **type** of *goodfellowi* was obtained from natives, while Mr. Thomas expressly states that **it** and a **second one** were got by Mr. Goodfellow himself on the island and kept **alive** for some months.

The following are the specimens available for examination in England, as far as I know :

*Zaglossus bruijni bruijni* Peters and Doria.

1 adult ♀ skin . . . . .	British Museum.
1 " ♂ stuffed and skeleton . . . . .	" "
1 " ♀ stuffed . . . . .	Tring "
1 young ♂ skin . . . . .	" "

*Zaglossus bruijni bartoni* Thos.

1 adult ♀ type skin . . . . .	British Museum.
2 " ♂♂, 1 skin, 1 stuffed, and skeleton . . . . .	Tring "

*Zaglossus bruijni villosissima* Dubois.

1 adult ♂ stuffed . . . . .	Tring Museum.
2 " ♂ skins . . . . .	" "

*Zaglossus bruijni goodfellowi* Thos.

1 adult ♀ type skin . . . . .	British Museum.
1 " ♀ stuffed . . . . .	Tring "
2 " ♂♂ skins and skeleton . . . . .	" "
1 " ? ? . . . . .	either Mr. Goodfellow or Mrs. Johnston.

*Zaglossus bruijni nigroaculeata* Rothsch.

1 adult ♂ type stuffed, skeleton and soft parts . . . . .	Tring Museum.
1 fere adult ♀ skin . . . . .	" "
1 young ♀ skin . . . . .	" "

In addition to these there is a young male from Kaimana mounted in the Tring Museum, which is very similar to the young ♀ of *nigroaculeata*, but has white spines, and two very old specimens (♂ ♀) from the same place living in the London Zoological Gardens with white spines. These three are more or less intermediate between *bartoni* and *nigroaculeata*, which is accounted for by the locality.

The following key to the forms will, I think, help to unravel the confusion :

- 1 { Pelage thick, short and woolly : 2.  
 { Pelage sparse, longer, more hair-like and harsh : 4.

- 2 { Colour of head paler than body : 3.  
 { Colour of head uniform with body : *Z. bruijni bartoni*. East of the Fly River.
- 3 { Pelage seal-brown to deep brown : *Z. bruijni bruijni*. Mount Arfak.  
 { Pelage pale brown : *Z. bruijni villosissima*. East shores of Geelvink Bay and North Coast.
- 4 { Entirely black, spines large, flat, black, grey, or black or grey with white tips ;  
 { a few long thin spines sometimes on lower flanks : *Z. bruijni nigroaculeata*. Sorong, McCluer's Inlet, and Onin Peninsula.  
 { Blackish to seal-brown, head somewhat paler, spines large, white and extending on to belly and chest : *Z. bruijni goodfellowi*. Salwatty Island.

I think that, from the evidence at present available, we are justified, in opposition to Mr. Allan, in concluding that there are five forms of *Zaglossus bruijni*, each confined to a more or less definite geographical area : but that in the lower north-western portions of the Arfak Peninsula and the foot-hills west of the Fly River the species is still in an unfixd state and that specimens are found there resembling one or the other of the five subspecies as well as all sorts of intergradations. I cannot, however, see why this should invalidate the five forms, which as far as we know occur locally over considerable separated areas.

In the same way I consider that, although in some small areas in Australia we find a mixed race of *Tachyglossus*, there are at least three good localised subspecies of *Tachyglossus aculeata* in addition to *T. a. lawesi* of New Guinea and *T. a. setosa* of Tasmania. When careful comparisons have been made, I even believe that we shall find that the specimens from South-west and North-west Australia and Cape York are also distinct.

I append a key of the five described races.

- 1 { Pelage thick, woolly, and pale cinnamon-brown, spines short, almost hidden, third  
 { claw stout and long : *T. aculeata setosa* Tasmania.  
 { Pelage sparser, more hair-like, dark brown or yellowish, third claw small : 2.
- 2 { Pelage thicker, spines medium very thick black-brown or grey and white :  
 { *T. aculeata aculeata* New South Wales and South Queensland.  
 { Pelage thinner or almost absent except on belly : 3.
- 3 { Size small, spines long and dense, white marked with brown or grey, hair  
 { brown : *T. aculeata lawesi* S.E. New Guinea.  
 { Size large : 4.
- 4 { Pelage almost absent except on belly, brown, spines long, thick and dense,  
 { white with brown markings or black with white tips : *T. aculeata acanthion*,  
 { Northern Territory of South Australia.  
 { Pelage well developed, long, yellowish, spines long, thin and very dense,  
 { white : *T. aculeata multiaculeata* Southernmost South Australia.

NEW *LITHOSIANAE*.

By THE HON. WALTER ROTHSCHILD, Ph.D., F.R.S.

(Continuation from Vol. XIX. p. 246.)

173. *Chionaema postdivisa* sp. nov.

♀. Head and antennae black; thorax black, tegulae and patagia orange; abdomen black.—Forewing orange; costal and terminal margins and tornal half of wing below median fold black.—Hindwing: basal half orange, apical half black narrowing to point on abdominal margin.

Length of forewing: 19 mm.

*Hab.* Lower Mambare River, British New Guinea, May 1906 (A. S. Meek).

174. *Chionaema bicolor* sp. nov.

♂. Head and antennae black, thorax dark orange, basal half of tegulae black; abdomen black, anal tuft rufous orange.—Forewing: basal three-fifths orange, outer two-fifths black.—Hindwing: inner three-fifths orange, outer two-fifths black, a long black streak in abdominal fold.

Length of forewing: 19 mm.

*Hab.* German New Guinea.

175. *Chionaema basialba* sp. nov.

♀. Head, antennae, and thorax liver-brown, hind part of thorax and ends of patagia white; abdomen, basal three segments grey, rest liver-brown, anal tuft white.—Forewing liver-brown; basal quarter white with basal brown spot, a median white blotch reaching from costa almost across cell, a white spot beyond on costa, a large white apical blotch and a white subterminal patch from tornus to vein 3, terminal row of black-brown spots joined by hairline.—Hindwing dark mouse-grey, terminal edge brown, fringe grey.

Length of forewing: 15.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

176. *Chionaema lignaria* sp. nov.

♂. Head, antennae, thorax and abdomen greyish creamy buff powdered with brown scales.—Forewing greyish cream-buff streakily clouded with brown scaling giving it the appearance of wood, a stigma-like dot in cell.—Hindwing greyish white washed with rosy grey towards apex.

Length of forewing: 12.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

177. *Chionaema pyralina* sp. nov.

♂. Antennae brown; head and thorax reddish liver-brown; abdomen sooty brown, anal tuft orange-buff.—Forewing reddish liver-brown with a purple flush; basal two-fifths completely saturated with blackish purple-chocolate, two bands



crossing cell, an anchor-like discal mark and a postdiscal band the colour of base, outer fifth of costa and termen chequered with dark spots.—Hindwing dark grey.

Length of forewing: 12 mm.

*Hab.* Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., August 1910 (A. S. Meek).

178. *Chionaema pyralina fasciata* subsp. nov.

♂. Differs from *pyr. pyralina* by having a white angled stigma on discocellulars and three complete waved transverse blackish purple-chocolate bands across disc of forewing.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., January 1906 (A. S. Meek).

179. *Chionaema punctifasciata* sp. nov.

♂. Head, antennae, thorax and abdomen slate-grey.—Forewing sooty brownish grey with four transverse bands of irregular darker spots edged with pale grey; a dull ochre spot in cell.—Hindwings brownish mouse-grey.

Length of forewing: 12.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, March 1906, 5000 ft. (A. S. Meek).

180. *Chionaema plagosus* sp. nov.

♂. Antennae brown; head, thorax and abdomen pale ash-grey, densely powdered with sooty scales.—Forewing: basal third ash-grey, powdered loosely with sooty scales, an almost obsolete sooty subbasal transverse band, median third of wing sooty brown-black, powdered sparsely with whitish grey scales, and with whitish stigma; outer third pale ash-grey, powdered sparsely with dark scales, a partly interrupted and obliterated dark subterminal band and a terminal row of dark spots from apex to vein 3.

♀ larger, forewing dull liver-brown, a large subbasal patch, a costo-cellular median patch, a small patch on inner margin, and a terminal broad band of grey.—Hindwing brown-grey.

Length of forewing: ♂ 13 mm., ♀ 16 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

181. *Chionaema nigrescens* sp. nov.

♂. Antennae, head, and thorax sooty grey-black; abdomen slate-grey, anal tuft orange-buff.—Forewing sooty slate-grey marbled and spotted with sooty black; a large hairy scent-organ on costa, which is white when reverted.—Hindwing: basal half wood-grey with yellowish tinge, outer half sooty grey, dark stigma.

♀. Larger and with darker hindwings.

Length of forewing: ♂ 19 mm.; ♀ 21 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

182. *Eurosia albida* sp. nov.

♀. Antennae yellowish; head and thorax greyish white; abdomen greyish white, anal tuft whitish buff.—Forewing milk-white with a few scattered

greyish brown scales, a grey dot beyond cell on costa; apex of wing sharply truncated.—Hindwing pale greyish cream.

Length of forewing: 7 mm.

*Hab.* Milne Bay, British New Guinea, February 1899 (A. S. Meek).

183. *Chrysallactis bipartita* sp. nov.

♂. Antennae chocolate-brown; head golden yellow; thorax and abdomen dark chocolate, anal tuft buff.—Forewing golden yellow, base and outer quarter rufous chocolate; a black line divides the rufous chocolate outer quarter from the yellow of main portion of wing.—Hindwing: semihyaline greyish wood-buff, outer third darker.

Length of forewing: 12 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

184. *Chrysallactis apiciplaga* sp. nov.

♂. Antennae brown; head golden yellow; thorax maroon-chestnut washed with opalescent purple; tegulae and front of thorax golden yellow; abdomen buff.—Forewing: basal three-fifths golden yellow, base maroon-chestnut, narrow black transverse lines enclosing yellow; outer two-fifths of wing opalescent blue with two cinnamon spots and a large golden yellow subapical patch, terminal millimetre of wing dark brown.—Hindwing abruptly truncated pale yellowish wood-grey washed with buff.

Length of forewing: 9 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek).

185. *Chrysallactis niveiceps* sp. nov.

♂. Antennae rufous; head snow-white; thorax chestnut, tegulae snow-white; abdomen cinnamon wood-brown, basal three segments washed with pale grey.—Forewing: basal two-thirds golden yellow, base chestnut, yellow margined outside by double transverse line, the inside of which is white, outside black; outer third chestnut.—Hindwing yellowish grey.

Length of forewing: 8.5 mm.

*Hab.* Haidana, Collingwood Bay, British New Guinea, April 1907 (A. S. Meek).

186. *Lithoprocis postcaerulescens* sp. nov.

♂. Antennae black-brown; head and thorax metallic golden bronze-green; abdomen brown-grey washed with metallic green and blue, anal tuft cinnamon-buff.—Forewing metallic golden green margined with opalescent blue.—Hindwing somewhat small and distorted, dark opalescent blue with dark grey streaks and abdominal area.

♀ has normal hindwings of dark brown-grey.

Length of forewing: ♂ 10—11.5 mm.; ♀ 11 mm.

*Hab.* La Oroya, Rio Inambari, Peru, September 1904, 3100 ft., dry season; Santo Domingo, Carabaya, 6500 ft., November 1902; Tinguri, Carabaya, Peru, 3400 ft., dry season, August 1904 (G. R. Ockenden).

Type ♂. La Oroya.

187. *Endoliche rufitincta* sp. nov.

♀. Antennae brownish yellow; head and thorax white, a buff patch on vertex; abdomen basal half white, rest dark buff.—Forewing white; a subbasal patch, two spots on costa and two on termen rufous cinnamon-orange, whole disc of wing down to inner margin occupied by large rufous cinnamon-orange patch bordered irregularly outside with grey and enclosing a white dot.—Hindwing white washed with grey.

Length of forewing: 11 mm.

*Hab.* Aroewarwa Creek, Maroewym Valley, Surinam, July 1905 (S. M. Klages).

188. *Endoliche major* sp. nov.

♀. Head, antennae, thorax, and abdomen rufous brown-grey variegated with dull white.—Forewing rufous brown-grey variegated with white on basal quarter of wing, costal area, and below median fold; a white transverse line from costa to vein 1 one-fifth from termen, whence run some white streaks to termen.—Hindwing semihyaline white.

Length of forewing: 17 mm.

*Hab.* Rio Huacamayo, Carabaya, Peru, 3100 ft., June 1904, dry season (G. R. Ockenden).

189. *Dolichaesia lignaria* sp. nov.

♂. Antennae head and thorax brown-buff; abdomen salmon-rose, anal tuft brown-buff with a few black hairs.—Forewing buff clouded and variegated with rufous scale patches more band-like in centre; giving wing the appearance of weather-worn, decayed wood.—Hindwing: basal half rose-crimson, outer half black.

Length of forewing: 10.5 mm.

*Hab.* Rio Huacamayo, Carabaya, Peru, 3100 ft., June 1904, dry season, (G. R. Ockenden).

190. *Afrida basipunctata* sp. nov.

♂. Antennae black with rufous pectinations; head, thorax and abdomen dark grey, tegulae and back of thorax white.—Forewing basal quarter satiny snow-white with three black spots, median three-eighths of wing dark grey forming a broad transverse median band with irregular edges, outer three-eighths white with three black spots in costal half, termen dark grey running into the wing in a large wedge-shaped patch, the point of which almost reaches median band.—Hindwing satiny grey-white.

Length of forewing: 13 mm.

*Hab.* Agualani, Carabaya, Peru, 9000 ft., September 1905 (G. R. Ockenden).

191. *Afrida fasciata* sp. nov.

♂. Antennae fuscous; head and thorax white; abdomen greyish wood-brown.—Forewing white; a baso-subbasal patch on costa running into median fold black-brown, a broad median, transverse, irregular band black-brown to median vein, fading from there to inner margin and dark brownish grey, a post-median transverse band waved and irregular black-brown to vein 7, thence to

inner margin fading to grey, termen and fringe to above tornus grey.—Hindwing white, stigma and terminal margin grey.

Length of forewing : 13·5 mm.

*Hab.* Monte Tolima, Colombia, 3500 metres, February 1910 (A. H. Fassl).

192. *Odozana roseiceps* sp. nov.

♂. Head pale pink ; antennae black-brown, a fuscous band two-thirds from base ; thorax black-brown, tegulae and patagia deep rose ; abdomen brown clothed with long, deep rose-coloured hair, anal tuft orange.—Forewing black-brown.—Hindwing : basal half deep rose, outer half black-brown, costal area wood-grey.

Length of forewing : 11·5 mm.

*Hab.* Santo Domingo, Carabaya, Peru, 6500 ft., November 1902, wet season (G. R. Oeckenden).

193. *Odozana bicolor* sp. nov.

♂. Head, antennae, and thorax purplish sooty grey ; abdomen carmine rose.—Forewing sooty grey.—Hindwing sooty grey, abdominal area carmine rose.

Length of forewing : 11 mm.

*Hab.* Onaca, Santa Marta, 2200 ft., November 1901, wet season (Engelke).

194. *Odozana purpurascens* sp. nov.

♀. Head, antennae, thorax, and abdomen sooty black washed with purple.—Forewing bright purple with coppery shade.—Hindwing : basal two-thirds carmine rose ; outer third black narrowing from apex to tornus, abdominal fringe black.

Length of forewing : 10 mm.

*Hab.* La Oroya, Rio Inambari, Peru, September 1904, 3100 ft., dry season (G. R. Oeckenden).

195. *Odozana griseola* sp. nov.

♂. Antennae brown ; head and thorax ash-grey, hind edge of vertex and tegulae pale rose ; abdomen carmine rose.—Forewing silvery ash-grey.—Hindwing carmine rose with broad slate-grey border.

Length of forewing : 9—10 mm.

*Hab.* Rio Janeiro ; San Jacinthe Valley, Theophilo Ottoni, Minas Geraes, 1907-8 (F. Birch).

196. *Odozana longistriga* sp. nov.

♂. Antennae black ; head and thorax mouse-grey, tegulae pale rose ; abdomen salmon-colour.—Forewing mouse-grey, nervures washed with black, forewing above and below median fold mauve-grey running out to a point on costa four-fifths from base ; a broad, cream-white stripe along median fold to termen, and inner margin cream-white.—Hindwing salmon-colour, a black margin from apex to vein 3, wing strongly excised from vein 3 to tornus.

Length of forewing : 8 mm.

*Hab.* Rio Huacamayo, Carabaya, Peru, 3100 ft., June 1904, dry season (G. R. Oeckenden).

197. *Odozana violaceogriseus* sp. nov.

♂. Head and thorax violaceous black, antennae intense black; abdomen wood-brown.—Forewing brownish violet, darker on outer quarter.—Hindwing brownish wood-grey.

Length of forewing: 8 mm.

*Hab.* Aroewarwa Creek, Maroewym Valley, Surinam; April 1905 (S. M. Klages).

198. *Odozana hieroglyphica* sp. nov.

♂♀. Antennae black; head and thorax maize-yellow, a black spot at base and a scarlet spot at apex of patagia; abdomen salmon-red, anal tuft and sides yellowish.—Forewing maize-yellow; a subbasal transverse band, costal half black, rest scarlet, double transverse black antemedian lines with space between, brown-grey in colour, outer antemedian line joined by a black longitudinal line to the double transverse postmedian zigzag lines below median vein, above this connecting line is a scarlet streak, space between postmedian lines brown-grey, outside postmedian lines two scarlet patches.—Hindwing salmon-pink, a sooty spot at apex.

Length of forewing: 9 mm.

*Hab.* Paramba, 3500 ft. (W. F. Rosenberg); Chimbo, 1000 ft., July 1897 (W. F. Rosenberg).

Type, Paramba.

199. *Odozana germana* sp. nov.

♀. Closely allied to the previous species. Antennae black; head and thorax cream-buff; abdomen pale salmon-red.—Forewing cream-buff; an indistinct subbasal black transverse line to median fold, two antemedian transverse black lines joining and ending on median fold, inner much angled; a subterminal broad irregular band of black streaks and some short ones on termen above and below vein 3.—Hindwing pale yellowish salmon-colour.

Length of forewing: 10.5 mm.

*Hab.* La Union, Rio Huacamayo, Carabaya, Peru, 2000 ft., January 1905, wet season (G. R. Ockenden).

200. *Odozana postrubida* sp. nov.

♂. Antennae black; head, thorax and abdomen brown-black, washed with oil-green, anal tuft very large.—Forewing: deep violet basal area, a patch on costal half beyond cell and below vein 1, on basal third of wing oil-green.—Hindwing deep carmine, crimson base and apex black.

Length of forewing: 12.5 mm.

*Hab.* Chiriqui, Panama.

201. *Odozana brunnescens* sp. nov.

♂. Head, antennae, thorax and abdomen sooty brown-black.—Forewing greyish liver-brown with purple wash; a broad band beyond middle paler.—Hindwing dark brown-grey.

Length of forewing: 9.5 mm.

*Hab.* Rio Huacamayo, Carabaya, Peru, 3100 ft., June 1904, dry season (G. R. Ockenden).

202. *Prepiella rubripuncta* sp. nov.

♂. Antennae black; head and thorax slate-grey washed with violet, tegulae rufous orange; abdomen orange-buff, anal tuft rufous-buff.—Forewing whitish grey, densely and closely irrorated with slate-grey; a large cream-buff patch occupies basal fourth of wing, an hour-glass-shaped median band of cream-buff with a crimson spot on narrowest part at lower discocellular, upper part of hour-glass smaller than lower.—Hindwing very rough and hairy, with large border of long stout hairs on abdominal margin, yellowish salmon-colour, a slate spot at apex.

♀ has normal non-hairy hindwings which are crimson.

Length of forewing: ♂ 8 mm.; ♀ 7.5 mm.

*Hab.* Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages); Perico, Orinoco, November 1898 (G. K. Cherrie).

Type ♂.

203. *Prepiella strigillata* sp. nov.

♂. Antennae black-brown, lamellate; head and thorax yellow; abdomen pale brick-red, two basal segments and anal tuft ochre-yellow.—Forewing yellow, washed with orange-crimson, more strongly on outer two-thirds; a median patch and a streak along median fold more entirely crimson, a curved transverse black line one-third from base, and on the enclosed basal one-third of wing a number of short black streaks, a postmedian strongly zigzag and angulated transverse line and a subterminal line black, between these lines a number of black streaks, fringe brown-grey.—Hindwing ochre-yellow strongly washed with rose-pink.

♀ Similar, but forewing less washed with crimson.

Length of forewing: ♂ 7.5 mm.; ♀ 8.5 mm.

*Hab.* La Union, Rio Huacamayo, Carabaya, Peru, 2000 ft., November 1904, wet season (G. R. Ockenden); Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages).

Type ♂.

204. *Callisthenia costilobata* sp. nov.

♂. Antennae brown; head greyish buffy white; thorax and abdomen dark greyish wood-brown.—Forewing dark blackish grey with intraneural buff streaks, a broad median transverse buff band washed and marked with crimson; costa bowed out into a broad lobe.—Hindwing crimson, outer abdominal margin broad dark brown.

Length of forewing: 9 mm.

*Hab.* Rio Colorado, Peru, 2500 ft., August—September 1902 (Watkins).

205. *Callisthenia prepielloides prepielloides* subsp. nov.

♂. Antennae brown; head metallic buff; thorax grey-brown, tegulae and patagia metallic buff; abdomen pale rufous buff-brown.—Forewing pale brown closely strigillated with darker brown; a large patch below median vein in basal half of wing and a broad postmedian band pale cream-buff, a crimson spot in middle of postmedian band.—Hindwing pale salmon-colour, fringe brown.

♀ larger, forewings darker.

Length of forewing: ♂ 8 mm.; ♀ 9.5 mm.

*Hab.* São Paulo, South Brazil.

206. *Callisthenia prepelloides boliviana* subsp. nov.

♂. Grey on forewing, and has pale rose hindwings with brown margin to hindwing from apex to vein 2.

*Hab.* Buenavista, East Bolivia, 750 metres, August 1906—April 1907 (J. Steinbach).

207. *Illice roseofuliginosa* sp. nov.

♀. Head and antennae sooty black, vertex with two white lines, collar pink; thorax sooty black, tegulae cream-white; abdomen dull rose.—Forewing sooty black with a few whitish hairs; a postmedian white transverse band interrupted between apex of cell and median fold so as to form, as it were, two patches.—Hindwing, basal two-thirds rose-pink, apical third sooty black, narrowing to tornus.

Length of forewing: 10 mm.

*Hab.* La Soledad, Prov. Entre Rios, April 9, 1905 (Miss E. A. Britton).

208. *Illice citrina intacta* subsp. nov.

♂. Differs from *citrina citrina* in the long black line from postmedian line along vein 3, and in the complete black margin of hindwing, which reaches tornus and does **not** stop at vein 3.

*Hab.* Rio Huacamayo, Carabaya, Peru, 3100 ft., June 1904, dry season (G. R. Ockenden).

209. *Illice bifasciata* sp. nov.

♀. Antennae black with white band on outer third; head black mixed with yellow; thorax yellow edged with black; abdomen dull rufous buff.—Forewing metallic maize-yellow, an ante- and a postmedian band metallic steel-blue.—Hindwing salmon-red, a sooty black spot at apex.

Length of forewing: 10 mm.

*Hab.* Santo Domingo, Carabaya, Peru, 6000 ft., November 1901, wet season; Rio Huacamayo, Carabaya, 3100 ft., June 1904, dry season (G. R. Ockenden).

Type: Santo Domingo.

210. *Illice mediofasciata* sp. nov.

♀. Antennae black; head and thorax brownish slate-grey, tegulae orange.—Forewing golden liver-brown; a median orange-yellow transverse band.—Hindwing salmon-crimson bordered with sooty black.

Length of forewing: 10 mm.

*Hab.* Buenavista, East Bolivia, 750 metres, August 1906—April 1907 (J. Steinbach).

211. *Illice lacteociliata* sp. nov.

♂. Antennae dark brown with white band towards tip; head and thorax greyish liver-brown, tegulae and front of thorax cream-coloured; abdomen salmon-colour, anal tuft brown.—Forewing greyish liver-brown; a large patch in basal third below median vein, a broadly interrupted median band, and terminal fringe cream-colour.—Hindwing crimson, a broad soot-black border.

Length of forewing: 6.5 mm.

*Hab.* Cucuta, Venezuela.

212. *Illice triplagiata* sp. nov.

♀. Antennae black with white band towards apex ; head and thorax cream-colour, hind part of thorax purple-black ; abdomen carmine.—Forewing brownish slate-grey, below median fold cream-colour divided by a black patch into two longitudinal patches, which are edged above with black ; a wedge-shaped cream patch edged with black runs in from costa to median nervure at apex of cell.—Hindwing crimson, a black spot at apex.

Length of forewing : 10.5 mm.

*Hab.* Huatuxco, Vera Cruz, Mexico.

213. *Lycomorphodes aenia* sp. nov.

♂. Antennae black ; head rufous buff ; thorax and abdomen black, strongly glossed with dark blue.—Forewing dark steel-blue with brownish cream median band slightly interrupted on median vein.—Hindwing yellowish grey, outer half sooty grey.

Length of forewing ; 11 mm.

*Hab.* Aroewarwa Creek, Maroewym Valley, Surinam, May 1905 (S. M. Klages).

214. *Lycomorphodes bicolor* sp. nov.

♀. Antennae black ; head and thorax yellowish orange-rufous ; abdomen dark slate-grey.—Forewing yellowish orange-rufous, paler towards apex.—Hindwing dark slate-grey.

Length of forewing : 12 mm.

*Hab.* Pichindé, West Cordillera, Colombia, 1600 metres (A. H. Fassl).

215. *Lycomorphodes tortricina* sp. nov.

♂. Antennae black, base dark buff ; head and thorax orange-buff, tegulae and patagia slate-grey ; abdomen dull yellowish wood-brown, basal segment and anal tuft dark orange-buff.—Forewing testaceous orange buff ; a median band somewhat diluted and cloudlike or evanescent brown, outer quarter of wing slate-grey with median buff streak.—Hindwing : basal two-thirds dirty buff, outer third strongly washed with wood-grey.

Length of forewing : 11 mm.

*Hab.* Caparo, Trinidad ; December 1905 (S. M. Klages).

216. *Talara nigroplagiata* sp. nov.

♂. Antennae black ; head and thorax silver grey ; abdomen dull scarlet-crimson.—Forewing whitish silver grey, sparsely powdered with black scales ; a black stigmatic dot, basal half below median vein creamy, powdered with black scales, a large quadrate patch below cell brownish sooty black.—Hindwing : basal two-thirds rose, outer third sooty brown.

♀. Darker ; only basal third of hindwing rose, outer two-thirds black.

Length of forewing : ♂, 9 mm. ; ♀, 9.5 mm.

*Hab.* Buenavista, East Bolivia, 750 metres, August 1906—April 1907 (J. Steinbach).



217. *Talara alborosea* sp. nov.

♂. Antennae black ; head and thorax greyish white ; abdomen salmon-rose, claspers orange-buff.—Forewing greyish white with a few scattered brown scales ; a subbasal brown patch below vein 1, and a curved, broad, dark brown band from centre of median vein to tornus.—Hindwing rose-pink.

Length of forewing : 8 mm.

*Hab.* Valencia, Venezuela.

218. *Talara schistaceoplagiata* sp. nov.

♀. Head, antennae, thorax and abdomen orange-yellow.—Forewing orange-yellow ; whole disc below subcostal vein occupied by a large brownish slate-grey patch edged with and spotted above with scarlet ; terminal edge scarlet, fringe yellow.—Hindwing pink, fringe yellow.

Length of forewing : 9 mm.

*Hab.* Ocuneque, Carabaya, Peru, 7000 ft. ; July 1904, dry season (G. R. Ockenden).

219. *Talara ignibasis* sp. nov.

♂. Antennae black with white band near tip ; head and thorax fiery orange washed with carmine ; abdomen sooty black, basal two segments orange washed with carmine, anal tuft dull brownish orange.—Forewing : basal quarter fiery orange washed with carmine, outer three-quarters above median nervure fiery orange washed with carmine, below median nervure black ; a black spot in cell joins black area below median vein, and a black streak in orange area from costa to above vein 7.—Hindwing sooty grey-brown, base rose.

Length of forewing : 10 mm.

*Hab.* Rio Huacamayo, Carabaya, Peru ; 3100 ft., June 1904, dry season (G. R. Ockenden).

220. *Talara miniata* sp. nov.

♀. Antennae black, basal three joints buff ; head and thorax rosy carmine ; abdomen greyish sooty black, basal segment pink.—Forewing rosy carmine ; apical two-thirds on and above subcostal vein yellow with a black costal streak, terminal fifth obliquely of wing wood-grey.—Hindwing sooty black-brown.

Length of forewing : 10 mm.

*Hab.* Fonte Boa, Upper Amazons, June 1906 (S. M. Klages).

221. *Talara roseata* sp. nov.

♂. Antennae, head and thorax creamy ; abdomen salmon-rose.—Forewing creamy flushed with pink.—Hindwing salmon-rose.

Length of forewing : 9.5 mm.

*Hab.* Rio Colorado, Peru, 2500 ft. ; August—September 1902 (Watkiss).

222. *Talara dilutior* sp. nov.

♀. Antennae brown ; head whitish ; thorax whitish grey, patagia and outer half of tegulae cream-white ; abdomen pinkish yellow.—Forewing pale cream

washed with very pale mustard-colour; two cuneate cream-white spots run in from costa.—Hindwing pinkish yellow.

Length of forewing: 8 mm.

*Hab.* Marcapata, East Peru, 4500 ft.

223. *Barsinella expansens* sp. nov.

♂. Antennae brown; head and thorax saffron-yellow; abdomen buffy amber-brown.—Forewing orange-buff; costa much bowed out and wing broad and abruptly rounded; an antemedian band of detached black spots and streaks, a faint median pale crimson line curved and angled, a postmedian zigzag transverse line and outside of it numerous black streaks, a terminal pale rose line.—Hindwing rose.

Length of forewing: 8 mm.

*Hab.* Bartica, British Guiana, June 1901.

224. *Clemensia reticulata* sp. nov.

♂. Antennae pale brown; head white; thorax cream-white with three pairs of black spots, tegulae and patagia entirely white; abdomen dark grey, anal tuft orange-buff.—Forewing white with black dots; medio-postmedian irregular zigzag transverse lines, between which there is a greyish wash and a number of black cross-lines and streaks on nervures, forming together a broad irregular band of black network.—Hindwing: basal two-thirds greyish white, outer third grey.

Length of forewing: 11–12.5 mm.

*Hab.* Rio Huacamayo, Carabaya, 3100 ft., June 1904, dry season; Tinguri, Carabaya, 3400 ft., August 1904, dry season; La Oroya, Rio Inambari, S.E. Peru, 3100 ft., March 1905, wet season (G. R. Ockenden).

Type: Rio Huacamayo.

225. *Hyposiccia abraxina* sp. nov.

♂. Has the appearance of a small smoky *Abraaxas grosulariata* with all yellow obliterated. Antennae dark grey; head dirty white; thorax dirty white, two black spots anteriorly and one on extreme hinder end of thorax; abdomen mouse-grey, anal tuft very large.—Forewing greyish white; a row of black spots along costa, a basal dot and subbasal spot black, an antemedian black zigzag line, a black stigma in cell, double postmedian waved lines of almost coalescent black spots between which is a mouse-grey band, subterminal and terminal rows of black spots.—Hindwing mouse-grey, stigma and terminal edge darker.

Length of forewing: 15 mm.

*Hab.* Khasia Hills, April 1894 (Native collectors).

226. *Asuridia miltochristoides* sp. nov.

♀. Has at first sight a great resemblance to *Miltochrista miniata*. Antennae pale brown; head pale pink; thorax pale carmine rose; abdomen pale yellowish wood-brown.—Forewing pale carmine-rose; a basal black spot on subcostal vein; an antemedian zigzag line, an oblique median broad line, a stigma, and a twice sharply angled postmedian line with black lines from it to termen along the nervures black edged with yellow.—Hindwing rose.

Length of forewing: 13.5 mm.

*Hab.* Khasia Hills, June 1895 (Native collectors).

227. *Melanaema asuroides* sp. nov.

♀. Resembles an *Asura*. Antennae dark brown; head carmine-rose, a brown spot on vertex; thorax deep brown edged with carmine-rose; abdomen dull carmine-rose.—Forewing purple-brown; a median large spot on costal region, a similar one on and above inner margin, and a dot on lower discocellular carmine-rose.—Hindwing semihyaline buffy grey washed with rose, fringe purple-brown.

Length of forewing: 12 mm.

*Hab.* Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., September 1910 (A. S. Meek).

228. *Melanaema apiciplaga* sp. nov.

♂. Antennae pale brown; head, thorax, and abdomen maize-buff.—Forewing maize-buff, outer two-fifths of wing from costa to vein 4 purplish black-brown, becoming much paler towards termen.—Hindwing paler maize-buff.

Length of forewing: 12 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3000 ft., October—December 1910 (A. S. Meek).

229. *Melanaema ochraceorufa* sp. nov.

♂. Antennae: basal half orange rufous, outer half rufous grey; head and thorax orange rufous; abdomen yellowish buff.—Forewing divided obliquely; baso-costal half rufous grey with costa bright rufous, apico-tornal half orange rufous, becoming darker towards termen.—Hindwing yellowish buff.

Length of forewing: 14 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3000 ft., October—December 1910 (A. S. Meek).

230. *Xanthetis luzonica obiensis* subsp. nov.

♂. Differs from *X. luzonica* in the much blacker forewings, the orange markings on disc being much smaller and the subterminal line almost absent.

♀. Has orange on forewing much extended, and a very broad subterminal orange band.—Hindwing: whole basal half orange.

*Hab.* Laiwui Obi, September 1897 (W. Doherty).

231. *Phacusosia grandis* sp. nov.

♀. Antennae black; head deep orange, a spot on frons and hinder half of vertex black; thorax black with an anterior and a posterior deep orange patch, tegulae deep orange edged with black; patagia, basal portion deep orange, rest black; abdomen deep orange, anal segment and edges of basal segment black.—Forewing black with purple gloss, intraneural spaces paler sooty grey; cell and patch below median nervure hyaline, hyaline spots on veins 4, 5, and 6.—Hindwing black strongly glossed with purple; basal two-thirds of costal area wood-grey, a hyaline streak below median vein.

Length of forewing: 22 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000—7000 ft., March 1911 (A. S. Meek).

232. *Graptasura bitincta* sp. nov.

♂. Antennae brown; thorax golden maize-yellow; abdomen greyish buff.—Forewing golden maize-yellow.—Hindwing yellowish buff.

Length of forewing: 8.5 mm.

*Hab.* Little Kei (Heinrich Kühn).

233. *Graptasura mediofascia* sp. nov.

♂. Antennae brown; head and thorax orange; abdomen buff.—Forewing maize-buff, orange on basal three-fifths of vein 1; a postmedian band from costa curving inwards along median vein, a bow-shaped streak above vein 1, and fringe very pale mauve-brown.—Hindwing cream-buff.

♀. Has forewing semihyaline-buff, and the bow-shaped mark above vein 1 is absent.—Hindwing almost hyaline cream-colour. One ♀ has the forewing darker buff than the rest.

Length of forewing: ♂ 13 mm.; ♀ 10.5–11.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

234. *Zygaenosia divisa* sp. nov.

♂. Antennae dark grey; head and thorax cream-white; abdomen greyish white, anal tuft yellowish.—Forewing: basal half obliquely cream-white, a subbasal black-brown patch on inner margin and an ill-defined large rusty patch, somewhat cloud-like, between subcostal vein and inner margin; outer half dark violet chocolate-brown with paler streaks, and a whitish zigzag median streak.—Hindwing cream-white.

Length of forewing: 7 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

235. *Zygaenosia albigrisea* sp. nov.

♂. Head, antennae, thorax, and abdomen slate-grey.—Forewing cream-white; outer two-fifths brownish mouse-grey.—Hindwing cream-white, fringe mouse-grey.

Length of forewing: 10 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

236. *Zygaenosia truncata* sp. nov.

♂. Head, antennae, and thorax black, an orange-rufous spot on tegulae; abdomen rufous orange, anal tuft black.—Forewing, basal three-fifths orange-rufous, a black stigma and some black marks on costa; outer two-fifths black, apex and termen to vein 3 abruptly truncated. Hindwing: basal two-thirds orange-rufous, outer third black.

Length of forewing: 12 mm.

*Hab.* Astrolabe Bay, German New Guinea (C. Wabnes).

237. *Zygaenosia nigrorufa* sp. nov.

♂ ♀. Entirely black; basal two-fifths of forewing and basal three-fifths of hindwing orange-rufous.

Length of forewing: ♂ 12.5 mm.; ♀ 14 mm.

*Hab.* Kumusi River, N.E. British New Guinea, July—August 1907 (A. S. Meek).

238. *Zygaenosia variabilis* sp. nov.

♂. There appear to be three main phases of this variable species, which again respectively appear with or without the antemedian black line.

**Form 1.** (*type*)—Entirely black, basal half of forewing except basal third of costa orange-rufous, basal three-quarters of hindwing orange-rufous.

**Form 2.**—Similar to Form 1, but head and thorax orange-rufous.

**Form 3.**—Entirely rufous; abdomen black, a broad or narrow postmedian zigzag black line on forewing and a subterminal row of black spots; margins of fore and hindwing black.

In all three phases a black zigzag antemedian line is sometimes present.

Length of forewing: 8—10 mm.

*Hab.* Mysol Island, New Guinea, January 27—February 7, 1899 (H. Kühn).

239. *Zygaenosia subhyalinifascia* sp. nov.

♂. Uniform sooty black, a broad almost hyaline greyish white band, 5 mm. broad, crosses the forewing one-quarter from base. Costal area of hindwing greyish white.

Length of forewing: 14.5 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek).

240. *Zygaenosia fuliginosa* sp. nov.

♂. Entirely pale sooty black. Disc of forewings semihyaline sooty grey.

Length of forewing: 14 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December, 1910 (A. S. Meek).

241. *Zygaenosia sinapis* sp. nov.

♀. Antennae black; head, thorax, and abdomen rufous mustard-yellow.—Forewing rufous mustard-yellow, nervures and margins black.—Hindwing dark sooty grey, costal area dark mustard-yellow.

Length of forewing: 15 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek).

242. *Asura arenaria* sp. nov.

♂. Antennae pale brown, strongly pectinated. Rest of insect dark yellowish buff; hindwing paler.

Length of forewing: 9 mm.

*Hab.* Kumusi River, N.E. British New Guinea, August—September 1907 (A. S. Meek).

243. *Asura liparidia* sp. nov.

♀. Head and antennae and thorax orange-buff; abdomen slightly paler.—Forewing bright orange-buff; a large subbasal patch of mauve greyish brown, a broad postmedian transverse band of same colour.—Hindwing buff, an indistinct grey postmedian interrupted transverse band.

♂ similar, but darker; antennae pectinated, band of hindwing darker, broader, and more distinct.

Length of forewing: 12.5 mm.

*Hab.* Kumusi River, N.E. British New Guinea, August to September 1907 (A. S. Meek).

244. *Asura basitesselata* sp. nov.

♂ ♀. Head, antennae, and thorax orange-buff; abdomen slightly paler.—Forewing bright orange-buff; two antemedian zigzag lines joined by a bar below subcostal mauve-brown, producing a tessellated appearance; a very broad irregular postmedian mauve-brown band enclosing a row of orange-buff spots.—Hindwing buff.

Length of forewing: 17 mm.

*Hab.* Kumusi River, N.E. British New Guinea, August—September 1907 (A. S. Meek).

245. *Asura citrinopuncta* sp. nov.

♂ ♀. Antennae dark brown; head dark golden yellow; thorax mauve-brown; tegulae and two lines dark golden yellow.—Forewing mauve-brown; rows of large golden yellow spots along costal, inner, and terminal margins, and irregular smaller golden yellow spots scattered over disc forming three ill-defined rows.—Hindwing buff, fringe brown.

Length of forewing: ♂ 10 mm., ♀ 12 mm.

*Hab.* Kumusi River, N.E. British New Guinea, August—September 1907 (A. S. Meek).

246. *Asura grisotincta* sp. nov.

♀. Antennae brown; head, thorax, and abdomen whitish cream-grey, more white towards anal segments of abdomen.—Forewing pale yellowish brown; some large spots on costa and terminal border cream-white, a subterminal row of five subbasal dots dirty cream-white.—Hindwing white, terminal margin greyish.

Length of forewing: 14 mm.

*Hab.* Pontianak, S.W. Borneo.

247. *Asura chrysomela reducta* subsp. nov.

♂. Differs from *chrysomela chrysomela* in the orange band on the forewing being reduced to a patch running from the inner margin to just beyond median vein. On the hindwing the band is reduced to a small spot in costal region.

♀. Has all bands narrower.

*Hab.* New Georgia, Solomon Islands, March 1904, Vella Lavella, Solomon Islands, March 1908 (A. S. Meek).

Type: New Georgia.

248. *Asura punctata* sp. nov.

♂. Antennae rufous; head pale orange; thorax pale orange, a black dot on patagia; abdomen pale orange.—Forewing pale orange; basal half with a number of black spots, outer half with a densely serpentine zigzag line on band, and a subterminal row of spots black.—Hindwing: basal two-thirds pale orange, outer third black.

Length of forewing: 11.5 mm.

*Hab.* Khasia Hills, Assam, April 1896 (Native coll.).

249. *Asura unifascia* sp. nov.

♀. Head, and thorax orange-buff; abdomen greyish buff, anal tuft very large.—Forewing orange-buff; a median transverse band mauve-grey-brown, a number of mauve-grey-brown dots in basal half and along nervures on terminal half.—Hindwing buff, a median grey shadow band.

Length of forewing: 11 mm.

*Hab.* Kandy, Ceylon.

250. *Asura hieroglyphica* sp. nov.

♂. Antennae pale brown, basal third golden yellow; head golden yellow; thorax golden yellow, black spots on patagia and hind part of thorax; abdomen buff.—Forewing golden yellow; a basal black spot and two black curved and angled transverse antemedian lines joined below subcostal vein, and on vein 1 by cross-bars; a zigzag black postmedian transverse line, from which proceed black lines along the nervures towards termen, which in turn are connected by oblique cross-bars, intraneural spaces crimson-scarlet, an oblique triangular black suffused patch from tornus to middle of median vein.—Hindwing buff.

Length of forewing: 16 mm.

*Hab.* Ninay Valley, Central Arfak Mts., Dutch New Guinea, 3500 ft., November 1908—January 1909 (A. E. Pratt).

251. *Asura flavopunctata punctatissima* subsp. nov.

♂. Antennae black, strongly pectinated; head orange; thorax black, tegulae, basal patch on patagia and central patch on thorax orange; abdomen black, with a few scattered orange scales.—Forewing black, covered all over with a number of brilliant orange highly irregularly shaped spots.—Hindwing bright fulvous orange, margin very wide black, narrowing from apex to tornus.

Length of forewing: 11 mm.

*Hab.* Near Octakwa River, Snow Mts., Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

252. *Asura flavopunctata flavopunctata* B. Baker.

♂. Differs from *f. punctatissima* in the brown, **not** black, ground colour of the forewing, and in the paler, more diluted orange spots, which run together and are less strongly marked, giving the wing a washed-out appearance. It is also smaller.

Length of forewing: 9.5 mm.

*Hab.* Upper Aroa River, British New Guinea, January 1903 (A. S. Meek).

253. *Asura marginata* sp. nov.

♂. Antennae black, pectinated; head orange, vertex with large black patch; thorax black, tegulae broadly edged with orange; abdomen black, sides with mixed orange scales.—Forewing: basal three-fourths orange rufous, apical fourth black; apical half of costa, four subbasal patches, and a median zigzag band black.—Hindwing: basal two-thirds orange fulvous, outer third black.

♀. Larger, antennae filiform, whole costa black, median band wider.

Length of forewing: ♂ 10.5 mm., ♀ 13 mm.

*Hab.* Suer Mefor, New Guinea, June—July 1897 (W. Doherty).

254. *Asura lacteoflava lacteoflava* subsp. nov.

♂. Head, antennae, and thorax dark buffy yellow; abdomen buff.—Forewing dark buffy yellow; six black dots in basal fourth, a black dot beyond cell; a postdiscal row of black striae-like spots, the one on vein 4 nearest termen.—Hindwing buffish cream-colour.

♀. Paler black dots and spots much fainter.

Length of forewing: ♂ 11 mm., ♀ 14 mm.

*Hab.* Dalhousie, N.W. India, June 1891.

255. *Asura lacteoflava aureata* subsp. nov.

♂. Differs from *l. lacteoflava* in the golden orange-buff colour of head, thorax, and forewings, and the black dots on vertex and thorax. On the forewings all black marks are changed to long hairlike black striae, and there is a terminal line of black dots. All wings are narrower.

*Hab.* Khasia Hills, Assam, July 1894 (Native coll.).

256. *Asura roseogrisea* sp. nov.

♂. Allied to *rubricosa* Moore. Antennae, head, and thorax yellow flushed with rose, a black dot on hind part of thorax; abdomen yellowish buff, darker on anal half.—Forewing rose-colour tinged with yellow; a basal black dot, a subbasal transverse band, and a postmedian band which is divided and becomes Y-shaped from vein 3 to costa slate-grey.—Hindwing buff saturated with pale rose.

♀. Paler and more yellow.

Length of forewing: 13 mm.

*Hab.* Lower Burma.

257. *Asura trizonata* sp. nov.

♂. Antennae pale brown, strongly pectinated; head and thorax dark yellowish buff; abdomen greyish buff, anal tuft buff.—Forewing dark yellowish buff; an antemedian and a median transverse band joined by cross-bar above vein 1 dull chocolate-brown, as is also the discocellular stigma, a postmedian transverse band with three lateral processes to termen and apex, and enclosing a median row of buff spots and joined to median band at inner margin dull chocolate-brown.—Hindwing buff with two terminal greyish marks.

Length of forewing: 12 mm.

*Hab.* Great Kei Island (H. Kühn).



258. *Asura strigatula* sp. nov.

♂. Antennae pale brown; head and thorax pale orange-buff; abdomen buff. —Forewing pale orange-buff; a subbasal and a much broader postmedian transverse band both composed of longitudinal coalescing striations purple-brown. —Hindwing buff.

Length of forewing: 10.5 mm.

*Hab.* Khasia Hills, Assam, April 1894 (Native coll.).

259. *Asura pallida* sp. nov.

♂. Antennae pale yellowish brown, pectinated; head and thorax pale whitish cream-colour; abdomen whitish grey tinged with buff. —Forewing pale cream-colour; a stigma, a basal costal spot, a subbasal and a postmedian band with two processes running to termen dull brown. —Hindwing milk-white.

Length of forewing: 10 mm.

*Hab.* Dorey, Dutch New Guinea, June 1897 (W. Doherty).

260. *Asura leopardina leopardina* subsp. nov.

♀. Antennae black; head and thorax orange spotted with black spots; abdomen dull orange with transverse black spots. —Forewing deep orange; fringe of termen, apical two-thirds of costa, and inner half of basal third of costa black; two subbasal spots, an antemedian band interrupted at median vein, a median band, a spot beyond this band, a zigzag postmedian band, and a subterminal row of spots black. —Hindwing pale orange-crimson edged with black.

♂. Similar, but smaller.

Length of forewing: ♂ 8 mm., ♀ 10 mm.

*Hab.* Toli-Toli, North Celebes, November—December 1895 (H. Fruhstorfer).

261. *Asura leopardina postvitreata* subsp. nov.

♂. Differs from *l. leopardina* in the much brighter and darker orange of the forewings, in the black upperside and anal tuft of abdomen, and in the vitreous hindwings with smoky black terminal margin and orange costa.

*Hab.* Bonthain Peak, South Celebes (H. Fruhstorfer).

262. *Asura quadrifasciata* sp. nov.

♀. Head, antennae, and thorax buffy orange, a black spot on tegulae; abdomen, basal half buffy grey, outer half pale sooty black, anal tuft buff orange. —Forewing buff orange; two basal spots, four curved and angled transverse bands joined by cross-bars to each other and to termen; termen and apical third of costa black. —Hindwing, basal half buffy orange, rest black.

Length of forewing: 13 mm.

*Hab.* Toli-Toli, North Celebes, November—December 1895 (H. Fruhstorfer).

263. *Asura subcruciata* sp. nov.

♂. Head, antennae, and thorax reddish orange, the latter with slate grey spots; abdomen orange buff. —Forewing orange suffused all over with scarlet; a black basal dot; a subbasal patch, two antemedian crossed lines, a stigma, and

two postmedian bands slate-grey, edged indistinctly with scarlet; terminal line scarlet.—Hindwing buff.

Length of forewing 10.5 mm.

*Hab.* Mount Malu, 1000—4000 ft., North Borneo, August—December 1894 (Hose coll.).

264. *Asura mediofascia mediofascia* subsp. nov.

♂. Antennae pale brown; head and thorax pale rose-colour washed with yellow; abdomen brownish buff.—Forewing pale rose washed with yellow towards margins; some subbasal spots; a median band, a stigma beyond, an oblique, zigzag subterminal line from costa to termen at vein 2, and a terminal line of dots slaty black.—Hindwing semihyaline pale rose.

♀. Differs in being more suffused with pale yellow, and the subterminal line replaced by dots.

Length of forewing: 9 mm.

*Hab.* Tambora, Sambawa, June 1896; Bali, March—April 1896 (W. Doherty).

Type: Sambawa.

265. *Asura mediofascia intensa* subsp. nov.

♀. Much larger than *m. mediofascia* and much deeper and purer rose-colour, and all markings much broader; terminal row of dots replaced by transverse line.

Length of forewing: 11.5 mm.

*Hab.* Sapit, Lombok, 2000 metres, April 1896 (H. Fruhstorfer).

266. *Asura coccineoflammeus* sp. nov.

♂. Antennae pale brown, first eight joints crimson; head and thorax brilliant flame-scarlet; abdomen buff.—Forewing brilliant flame-scarlet crossed by four rather indistinct, zigzag, angled, slate-grey bands.—Hindwing buff suffused with salmon-colour.

♀. Larger and brighter.

Length of forewing: ♂ 14.5 mm., ♀ 17 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000—7000 ft., January 1911 (A. S. Meek).

267. *Asura bicolor* sp. nov.

♂. Entirely sooty black. A large orange rufous ovoid patch occupies the central third of forewing below subcostal vein, and an oblong patch occupies the same part of hindwing from costa to median fold.

♀. Similar, but patch on forewing larger.

Length of forewing: ♂ 12 mm., ♀ 11 mm.

*Hab.* Near Octakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910, Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., August 1910 (A. S. Meek).

268. *Asura pseudojosiodes* sp. nov.

♂. Resembles at first sight a *Josiodes*. Antennae black, pectinated; head orange, black spot on vertex; thorax orange with black spots; abdomen sooty black, segmental fringes of outer half and anal tuft mixed with orange hairs.—Forewing: basal three-fifths golden orange, costa, inner margin, and a transverse line

which curves outwards running along under vein 1 towards tornus black; outer two-fifths black; an ill-defined interrupted band, and a large subterminal ovoid patch golden orange.—Hindwing black.

Length of forewing: 20 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

269. *Asura postbicolor* sp. nov.

♂. Very close to *mediofascia*, but at once distinguished by the hindwings and abdomen. Antennae pale brown; head and thorax dirty rose-pink; abdomen black, basal segment and anal tuft rose-colour.—Forewing rose-pink; a sub-basal patch, some basal spots, a median transverse band, a spot beyond, a post-discal zigzag band, and the terminal edge sooty black.—Hindwing sooty black, base rose-pink.

Length of forewing: 10 mm.

*Hab.* Dili, Timor, May 1892 (W. Doherty).

270. *Asura thomensis* sp. nov.

♀. Antennae dull brown; head and thorax pale orange-buff; abdomen buff.—Forewing pale orange-buff; an antemedian, a median, and a postmedian band mauve brownish grey, the two former somewhat coalescent.—Hindwing buff.

Length of forewing: 11 mm.

*Hab.* Island of St. Thomé, West Africa, October—November 1899 (A. Mocquerys).

271. *Asura calamaria mediopuncta* subsp. nov.

♂. Antennae pale brown; head orange-buff; thorax orange-buff with black dots; abdomen sooty grey, almost hidden by long yellow hairs, anal tuft orange-buff.—Forewing orange-buff; a black basal dot on costa and subcostal vein and a round black spot at end of cell.—Hindwing paler.

♀. Much paler, forewings lemon-buff, hindwings cream-colour, abdomen silvery grey.

Length of forewing: ♂ 14 mm., ♀ 13 mm.

*Hab.* Khasia Hills, Assam, April 1894 (Native coll.).

Differs by its much darker yellow colour and larger spots.

272. *Asura ocnerioides* sp. nov.

♂. Antennae black-brown, strongly pectinated; head and thorax sulphur-yellow; abdomen, basal two-thirds greyish white, apical third sooty black.—Forewing white; costal edge black, apex pale grey, fringe grey.—Hindwing white.

♀. Similar, but larger, and only last segment of abdomen and anal tuft black.

Length of forewing: ♂ 11.5 mm., ♀ 12.5.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

One ♂ has on the forewing an oblique dark grey band from base of vein 7 to vein 1. This I propose to call ab. *strigata* ab. nov.

273. *Asura mimetica* sp. nov.

♂. Is a complete mimic of *Asura avernalis*, but has strongly pectinated, **not** filiform, antennae. Antennae, basal third of shaft orange-scarlet, rest of shaft sooty grey-brown, pectinations sooty grey-brown; head and thorax orange-scarlet, latter with blackish slate-grey stripes; abdomen blackish slate-grey, anal tuft reddish brown.—Forewing orange-scarlet; four transverse bands, three subterminal patches and terminal fringe blackish slate-grey.—Hindwing blackish slate-grey.

Length of forewing: 13 mm.

*Hab.* Tugela, Solomon Islands (Woodford).

274. *Asura miltochristina* sp. nov.

♂♀. Resembles *Miltochrista cruciata*. Antennae brown; head and thorax scarlet; abdomen salmon-rose.—Forewing scarlet; double cross-like antemedian bands merging into a number of rings towards inner margin, a semicircular postmedian band, a number of streaks to termen, and fringe slate-grey.—Hindwing salmon-rose.

Length of forewing: 14.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

275. *Asura fasciolata* sp. nov.

♂. Antennae brown; head and thorax scarlet; abdomen pale yellowish pink.—Forewing yellow with scarlet streaks and spots; a basal dot, a subbasal curved row of dots, a curved median band, a curved postmedian line, a very broad subterminal band, and a row of terminal dots blackish slate.—Hindwing pale yellowish pink.

Length of forewing: 13.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February 1906 (A. S. Meek).

276. *Asura insularis* sp. nov.

♂. Similar to *pyrrhanta* Meyr. Antennae: basal quarter scarlet, rest dark brown; head and thorax scarlet, **not** orange-yellow; abdomen salmon-rose.—Forewing orange-scarlet, **not** golden yellow, with scarlet streaks in outer third; two basal dots, two antemedian bands, a postmedian oblique curved band joined to former under costa, some subterminal clouding, and fringe slate-grey.—Hindwing salmon-rose, **not** buffy yellow.

♀. Larger.

Length of forewing: ♂ 15 mm., ♀ 18 mm.

*Hab.* St. Aignan, Lonisiade Islands, October 1897, Goodenough, D'Entrecasteaux Islands, December 1896 (A. S. Meek).

277. *Asura pyrrhauroides* sp. nov.

♀. Antennae brownish scarlet; head scarlet with brown-grey central band; thorax scarlet with brown-grey spots; abdomen: above basal half fuscous buff, apical half rose.—Forewing: basal half orange-yellow washed and closely streaked all over with scarlet; basal fifth occupied by a network of slate-grey, a median

oblique broad slate-grey band, and a similar bent postmedian one from which proceed to termen a number of semi-coalescent slate-grey streaks, fringe blackish.—Hindwing pale salmon-rose.

Length of forewing: 17 mm.

*Hab.* Upper Setekwa River, Snow Mountains, Dutch New Guinea 2000–3000 ft., September 1910 (A. S. Meek).

278. *Asura avernalis bougainvillei* subsp. nov.

♀. Differs from *a. avernalis* in the slate-grey bands of the forewings being much wider and almost coalescent, so that the scarlet ground colour is only visible in the form of patches and spots on the inner two-thirds of wing, **not** in the form of bands, and the outer scarlet band and three terminal patches much reduced; the scarlet also is much mixed with yellow. The blackish slate outer half of hindwing is reduced to less than half its width.

♂. Differs on forewings in same manner, and the hindwings are paler slate-grey.

*Hab.* Bougainville Island, Solomon Islands, May 1904 (A. S. Meek).

279. *Asura avernalis isabellina* subsp. nov.

♂. Differs from *a. avernalis* in having the whole abdomen salmon-pink; and in the forewing being entirely blackish slate with twelve small orange-scarlet spots. Basal and abdominal portions of hindwing yellowish pink.

*Hab.* Islets near Isabel, Solomon Islands (Cayley Webster).

280. *Asura avernalis floridensis* subsp. nov.

♀. Differs from *a. avernalis* on the forewings in the slate-grey bands being much narrower, so that the ground colour appears as five broad orange-scarlet bands. On the hindwing the slate-grey outer half is absent, only three slate-grey subterminal spots and a dark fringe remaining.

*Hab.* Florida Island, Solomon Islands, June 1901 (A. S. Meek).

281. *Asura metascota analogus* subsp. nov.

♂. This bears the same relation to *m. metascota* that *a. floridensis* does to *a. avernalis*.

Differs from *m. metascota* on the forewing in the paler yellowish scarlet ground colour and in having the black replaced by slate-grey and reduced to a pair of coalescent antemedian and a similar pair of postmedian bands. The hindwing is reddish buff with a wide slate-grey margin, **not** entirely sooty black.

The ♀ is also more yellowish on forewing and shows the same differences on hindwing.

*Hab.* Isabel Island, Solomon Islands, June 4—July 9, 1901 (A. S. Meek).

282. *Asura metascota feminina* subsp. nov.

Has in the ♂ the black on forewing much reduced and ground colour orange-scarlet, while in the ♀ the black markings are wider, so that both sexes are alike.

*Hab.* Vella Lavella, Solomon Islands, February 1908 (A. S. Meek).

283. *Asura miltochristaemorpha* sp. nov.

♂. Antennae, head, and thorax golden yellow, and a fuscous dot on patagia; abdomen pale carmine with yellow hairs on basal segment and in anal tuft.—Forewing: basal three-fifths golden-yellow, apical two-fifths orange-scarlet; two antemedian zigzag-bent mauve-brown bands and two similar postmedian ones; the inner postmedian and outer antemedian lines are apparently joined below median fold by a horizontal line; the outer postmedian is much clouded and runs out in streaks to termen; fringe mauve-brown.—Hindwing rose-pink.

♀. Larger.

Length of forewing: ♂ 12.5 mm., ♀ 18 mm.

*Hab.* Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., August 1910 (A. S. Meek).

284. *Asura infumata rufotincta* subsp. nov.

♂. Differs from *i. infumata* in the rufous orange forewings and the much blacker hindwings.

♀. Differs in the darker orange forewings.

*Hab.* Khasia Hills, Assam, July 1894 (Native coll.).

285. *Miltochrista parameia* sp. nov.

♂. Antennae black; head orange; thorax orange, black spots on patagia and hind part of thorax; abdomen orange.—Forewing milk-white, base orange; a basal spot and three antemedian bands of three spots each black, outer two-fifths of wing black with intraneural white streak.—Hindwing semihyaline white with sooty margin.

♀. Larger, all wings cream-white; two curved antemedian bands, a median band, and a stigma on forewings brown-black; nervures in outer two-fifths of forewings black; brown-black striae on nervures in outer fifth of hindwings.

Length of forewing: ♂ 16 mm., ♀ 18 mm.

*Hab.* Mauson Mountains, Tonkin, 2300 metres, April and May (H. Fruhstorfer).

286. *Miltochrista germana* sp. nov.

♂. Very close to *spilosomoides* Moore, but darker, more orange-buff all over. Differs on forewing by having the median band very distinct and a curved postmedian band of ten spots from which long streaks run out almost to termen.

*Hab.* Khasia Hills, Assam, February 1894 (Native coll.).

287. *Miltochrista subcruciata* sp. nov.

♂. Differs from *cruciata* in its much smaller size, rose ground colour washed with carmine, and very pale and indistinct bands on disc of forewing.

Length of forewing: 11.5 mm.

*Hab.* Little Kei Island (H. Kühn).

288. *Miltochrista quadrifasciata* sp. nov.

♂. Head, antennae, thorax, and abdomen yellow washed and suffused with salmon-red — Forewing yellow suffused with scarlet; antemedian, median, and

two postmedian more or less zigzag slate-grey bands.—Hindwing semihyaline pinkish buff.

Length of forewing : 13 mm.

*Hab.* German New Guinea.

289. *Miltochrista coccinea* sp. nov.

♂. Antennae yellow ; head and thorax orange-scarlet with black dots ; abdomen brown-buff.—Forewing orange-scarlet ; two antemedian bands in form of a cross, a double angled postmedian band bent inwards so that it meets the arms of the cross at costal and inner margin, and three postdiscal streaks sooty brown-black.—Hindwing salmon-colour.

Length of forewing : 11·5 mm.

*Hab.* Khasia Hills, Assam, October 1894 (Native coll.).

290. *Miltochrista dohertyi* sp. nov.

♂. Antennae rufous, head and thorax orange-scarlet with slaty-brown dots ; abdomen salmon-rose mixed with greyish hairs on basal two segments.—Forewing scarlet ; three basal dots, a zigzag subbasal band from costa to vein 1, antemedian and median bands very irregular, joined below subcostal vein, a postmedian serpentine band with broad streaks to termen, and fringe slaty wood-brown.—Hindwing semihyaline buff strongly washed with rose.

♀. Similar, but bands and streaks on forewing much fainter.

Length of forewing : ♂ 18 mm., ♀ 19·5 mm.

*Hab.* Tambora, Sambawa, 2500—4000 ft., June 1896 (W. Doherty).

291. *Miltochrista irregularis* sp. nov.

♀. Antennae whitish ; head cream-white flushed with pink, a median dark spot ; thorax and abdomen cream-white flushed with pink.—Forewing pale whitish pink, termen widely rose ; basal quarter powdered with brown scales, costa and curved transverse line brown ; in outer three-quarters a median bent band, a stigma, a very straggling zigzag postmedian line and three or four subterminal spots brown.—Hindwing pale rose.

Length of forewing : 8·5 mm.

*Hab.* Youbai, Hainan, June 1904.

292. *Miltochrista rosacea* sp. nov.

♂. Head, antennae, and thorax yellow washed with rose ; abdomen grey-buff.—Forewing rose suffused with yellow along costa, below vein 1 and along termen ; an oblique median band, a stigma, a subterminal row of streaks and a terminal row of dots sooty black.—Hindwing semihyaline pale rose.

Length of forewing : 12 mm.

*Hab.* West Java.

293. *Miltochrista flavoplagiata* sp. nov.

♂. Antennae golden ; head and thorax golden orange heavily spotted with black ; abdomen black, anal tuft and some lateral spots orange.—Forewing purplish black ; four large and two smaller patches in basal half, and some faint

streaks and two terminal patches and a spot in outer half golden orange.—Hindwing black.

♀. Larger, wings slate-grey; spots, streaks, and patches on forewings much larger and paler yellow; a few terminal yellow marks on hindwing. Abdomen golden yellow with some slate bands.

Length of forewing: ♂ 15 mm., ♀ 18.5 mm.

*Hab.* Sula, Mangoli, October 1897 (W. Doherty).

294. *Miltochrista elongata* sp. nov.

♂. Antennae black; head and thorax black with yellow spots and edges; abdomen black slightly powdered with yellow scales.—Forewing black-brown; basal two-thirds with suffused and somewhat obliterated orange streaks and spots.—Hindwing orange, outer third black.

♀. Similar, larger, and forewing much paler.

Length of forewing: ♂ 19 mm., ♀ 21 mm.

*Hab.* Near Octakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

295. *Miltochrista biplagiata* sp. nov.

♂. Antennae black; head orange with black spots; thorax black with orange-scarlet spots and edges; abdomen: four basal segments orange, apical segments black, anal tuft and valvular appendages orange with black tips.—Forewing deep blackish chocolate washed with greyish mauve; some basal rufous orange spots, a rufous orange subbasal transverse band, a large orange antemedian patch from inner margin to submedian fold and a similar one above it on costa, a large median crimson spot on costa and one below it at origin of vein 2, a row of postmedian red spots, and a somewhat indistinct row of terminal red spots.—Hindwing: basal half orange, outer half sooty black.

♀. Larger, anal tuft entirely black; basal orange portion of hindwing smaller and less extended.

Length of forewing: ♂ 17 mm., ♀ 20 mm.

*Hab.* Near Octakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

296. *Eutane semivitrea* sp. nov.

♂. Antennae black, strongly pectinated; head: frons orange buff, vertex black; thorax black, tegulae and base of patagia orange; abdomen black, anal tuft and valvular appendages buff.—Forewing black, subbasal broad band, antemedian band, three median quadrate patches, a postmedian band, and three subbasal patches rufous orange.—Hindwing semihyaline rufous orange; outer third, costal and abdominal margins black.

♀. Antennae black, filiform; head orange-buff; thorax black, tegulae, basal two-thirds of patagia and central spots orange-buff; abdomen black, anal tuft orange-buff.—Forewing black; subbasal band, antemedian band, three elongate ovoid median patches, a postmedian interrupted band, and three very large subterminal patches orange-buff.—Hindwing, basal half orange-buff, outer half black. Another ♀ larger, pale markings more rufous.

Length of forewing: ♂ 11 mm., ♀ 13—15.5 mm.

*Hab.* Fort Mackay, Queensland (♂ ♀); Kuranda, near Cairns, Queensland (♀).



297. *Thalarcha fuscogrisea* sp. nov.

♂. Antennae pectinated, sooty brown, tip white; head white; thorax dark brown, tegulae whitish; abdomen orange-buff.—Forewing, basal two-thirds whitish grey, costa and antemedian zigzag band dull brown, basal dot and median stigma black; outer third whitish grey densely powdered with brown scales, a broad dark dull brown postdiscal band and three brown subterminal spots.—Hindwing orange-buff, apex broadly brownish sooty black.

Length of forewing: 11 mm.

*Hab.* Parkside, South Australia.

298. *Philenora transfascia* sp. nov.

♂. Antennae brown; palpi very long, basal and terminal segment brown-black, middle segment white; head white; thorax white, a hinder patch brown, tegulae and front half sprinkled with brown scales.—Forewing milk-white; a subbasal and antemedian costal patch, two antemedian costal dots, a median band much expanded towards inner margin, a postmedian tiny dot and a costal spot, and two terminal white-dotted patches brown-black.—Hindwing grey. A second ♂ from Milne Bay has the spots and blotches smaller and the median band interrupted.

Length of forewing: 8–9 mm.

*Hab.* Upper Aroa River, British New Guinea, February 1903; Milne Bay, British New Guinea, February 1899 (A. S. Meek).

Type, Upper Aroa River.

299. *Diarhabdosia roseothorax* sp. nov.

♂. Antennae black serrated; head greyish buff, vertex slate-grey; thorax slate-grey, tegulae brown edged with buff, patagia rose-pink, base buff; abdomen slate-grey.—Forewing pale liver-brown; inner margin and terminal edge slate-grey, costal area and line below vein 1 yellowish buff.—Hindwing semihyaline greyish-white, passing into sooty grey on outer half.

♀. Differs in being entirely sooty-grey with exception of frons, edges of tegulae, patagia, and the costal region and stripe under vein 1 on forewing, which are similar to ♂.

Length of forewing: ♂ 13–14 mm., ♀ 12 mm.

*Hab.* La Oroya, Rio Inambari, S.E. Peru, 3100 ft., wet season, October 1904; La Union, Rio Huacamayo, Carabaya, Peru, 2000 ft., wet season, November 1904 (G. R. Ockenden).

Type, ♂, La Oroya.

300. *Diarhabdosia cinerea* sp. nov.

♂. Antennae black; head, thorax, and abdomen slate-grey.—Forewing brown-grey, a whitish shade in outer half.—Hindwing mouse-grey.

Length of forewing: 14 mm.

*Hab.* Fonte Boa, Upper Amazons, October 1906 (S. M. Klages).

301. *Eurylomia similliforma* sp. nov.

This species has the colour-pattern of *ochreatea* Druce, with the shape of *cordula* Boisid.

♂. Antennae black ; head and thorax orange ; abdomen, basal segment slate-grey, rest orange tawny buff, anal tuft sooty brown-black, valves tawny buff edged with sooty black.—Forewing tawny orange-buff ; costal edge, broad terminal margin and outer two-thirds of inner margin sooty grey-black.—Hindwing costal two-thirds brownish tawny grey covered with short androconia-like scales, abdominal third tawny orange-buff, fringes black.

♀. Hindwing normal, costal fourth sooty black.—Forewing terminal margin expanded widely at tornus and apex.

Length of forewing : ♂ 24 mm., ♀ 27 mm.

*Hab.* Guatil!!

### 302. *Schistophleps costimacula* sp. nov.

♂. Antennae pale brownish yellow ; head and thorax milk-white ; abdomen greyish white.—Forewing milk-white ; an antemedian, a postmedian, and a large median costal patch grey-brown, some very faint dusky marks at termen and on inner margin.—Hindwing white.

♀. Larger, and has fore- and hindwing washed with dirty buff.

Length of forewing : ♂ 12 mm., ♀ 14 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (A. S. Meek).

### 303. *Schistophleps noloides* sp. nov.

♂♀. Head, antennae, and thorax pale testaceous grey ; abdomen greyish white.—Forewing creamy white ; in basal half a brown oblique band from costa to median fold and a brown patch on costal area, outer half covered with coalescent fuscous brownish grey patches, almost hiding ground colour.

Length of forewing : 11.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., March 1906 (♀) ; Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek) (♂).

♀ Type.

### 304. *Eriomastyx goliathina* sp. nov.

♂. Antennae pale testaceous buff, heavily ciliated ; head and thorax buff ; abdomen pale earth-brown.—Forewing opalescent hyaline buff sprinkled with fine hairs ; two dots, antemedian and median transverse zigzag bands, and a postmedian band from costa to vein 2 hyaline grey.—Hindwing opalescent hyaline pale buff.

Length of forewing : 12.5 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000–7000 ft., January 1911 (A. S. Meek).

### 305. *Caulocera fasciolata fasciolata* subsp. nov.

♂. Antennae, head, and thorax dirty cream-white ; abdomen dull white.—Forewing dirty cream-white ; an antemedian oblique band, two crossed irregular median bands, a broad postdiscal oblique band from costa to tornus, and a row of terminal spots testaceous yellowish ; a central brown stigma.—Hindwing milk-white.

Length of forewing : 10.5 mm.

*Hab.* Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek).

306. *Caulocera fasciolata punctistriata* subsp. nov.

♂. Differs from *f. fasciolata* in forewings being pure white and antemedian and postdiscal bands being broken up into spots.

♀. Semihyaline white and median band on forewing absent, and postdiscal band divided into postdiscal subterminal bands.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

307. *Chamaita fascioterminata* sp. nov.

♂. Head, antennae, thorax, and abdomen creamy white.—Forewing semihyaline white; three semi-obsolescent testaceous yellow-brown oblique bands from costa to median vein in basal two-thirds of wing, a subterminal band and terminal row of spots of same colour.

Length of forewing: 9.5 mm.

*Hab.* Milne Bay, British New Guinea, February 1899 (A. S. Meek).

308. *Chamaita griseobasis* sp. nov.

♂. Head, antennae, and thorax testaceous buffy grey; abdomen brownish grey, anal tuft buff.—Forewing opalescent hyaline creamy white; a cellular stigma, a basal and subbasal band brown-grey.—Hindwing opalescent hyaline creamy white.

♀. Head, antennae, thorax, and abdomen testaceous yellowish grey.—Forewing opalescent hyaline buff; a hyaline grey dot in cell and subbasal band.—Hindwing opalescent hyaline cream-white.

Length of forewing: ♂ 11 mm., ♀ 13.5 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., April 1906 (A. S. Meek).

309. *Chamaita niveata* sp. nov.

♀. Head, antennae, thorax, and abdomen white.—Fore- and hindwing semihyaline snow-white, a faint grey dot on end of cell.

Length of forewing: 11.5 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, March 1911 (A. S. Meek).

310. *Palaeopsis testacea* sp. nov.

♂. Head, antennae, thorax, and abdomen pale, testaceous wood-brown.—Forewing greyish buff, clouded and powdered with brown scales; an ocellus-like stigma.—Hindwing greyish buff, yellowish towards tornus.

Length of forewing: 8 mm.

*Hab.* Kumusi River, N.E. British New Guinea, June 1907 (A. S. Meek).

311. *Palaeopsis suffusus* sp. nov.

♂. Head, antennae, and thorax white; abdomen greyish white.—Forewing cream-buff, suffused with rufous scales, denser towards apex and termen; a brown spot on inner margin, on costa, and two brown streaks on discocellulars.—Hindwing cream-white.

Length of forewing: 8 mm.

*Hab.* Biagi, Mambare River, 5000 ft., British New Guinea, February 1906 (A. S. Meek).

312. *Nudaria variegata* sp. nov.

♂. Head and thorax milk-white.—Forewing milk-white; a subbasal, an antemedian and two postmedian oblique irregular bands brown-buff.—Hindwing brown-buff.

Length of forewing : 7 mm.

*Hab.* Kumusi River, N.E. British New Guinea, August 1907 (A. S. Meek).

313. *Nudaria chamaitoides* sp. nov.

♂. Resembles ♀ *Chamaita griseobasis* Rothsch.

Antennae pale yellowish brown; head and thorax cream-white; abdomen whitish grey.—Forewing semihyaline milk-white washed with buff, somewhat iridescent; a few greyish indistinct marks on costa and margins.—Hindwing semihyaline white.

♀. More hyaline.

Length of forewing : ♂ 13 mm., ♀ 12 mm.

*Hab.* Biagi, Mambare River, British New Guinea, 5000 ft., February—March 1906 (A. S. Meek).

314. *Nudaria simillima* sp. nov.

♀. Resembles closely *chamaitoides*, but differs in having a median line of spots and a toothed zigzag postmedian band.

*Hab.* Angabunga River, affluent of St. Joseph's River, British New Guinea, 6000 ft. and upwards, November 1904—February 1905 (A. S. Meek).

315. *Gymnochroma plagiata* sp. nov.

♂. Head, antennae and thorax cream-white; abdomen dirty white.—Forewing cream-white; irregular bands in basal half and large irregular patches in outer half yellowish testaceous brown.—Hindwing milk-white.

Length of forewing : 9 mm.

*Hab.* Biagi, Mambare River, British New Guinea, January 1906 (A. S. Meek).

*Caprimimodes* gen. nov.

Differs from *Diduga* in its very long filiform antennae and in having in hindwing veins 6 and 7 separate from cell, **not** stalked.

316. *Caprimimodes mimetica* sp. nov.

♂. Antennae, head, and thorax black, a golden spot on outer edge of tegulae; abdomen black.—Forewing black; a large golden yellow patch occupying most of the basal half, and a large rufous maroon patch occupying most of the apical half; a white median spot on fringe.—Hindwing, basal two-fifths semihyaline golden yellow washed with sooty slate, outer three-fifths black.

Length of forewing : 14 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

This very remarkable insect is an exact mimic of *Caprimima postvitrea* Rothsch.

317. *Eugoa fasciata fasciata* subsp. nov.

♂. Antennae brown; head white; thorax chocolate, tegulae white; abdomen brown-buff.—Forewing chocolate; a subbasal band to above vein 1, a median band, and a semicircular subterminal band white.—Hindwing: basal half buff, outer half grey-brown.

Length of forewing: 11 mm.

*Hab.* Haidana, Collingwood Bay, North British New Guinea, April 1907 (A. S. Meek).

318. *Eugoa fasciata subfasciata* subsp. nov.

♂. Differs from *f. fasciata* by having the semicircular subterminal band of forewing almost obliterated between vein 5 and tornus, where there remains a white spot.

Length of forewing: 12.5 mm.

*Hab.* Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek).

319. *Eugoa transfasciata* sp. nov.

♂. Antennae testaceous; head creamy white; thorax purplish chocolate, tegulae, base of patagia and front of thorax creamy white; abdomen buff.—Forewing creamy white; curved antemedian and postmedian bands and a terminal patch between veins 1 and 7 purplish chocolate.—Hindwing buff, a dark spot at apex.

Length of forewing: 13 mm.

*Hab.* Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek).

320. *Eugoa similis* sp. nov.

♀. Allied to *bipunctata*.

Antennae pale brown; head cream-white; thorax purplish chocolate, base of patagia and front third of thorax cream-white; abdomen grey-buff.—Forewing white; a basal spot, an antemedian band, two large postmedian patches joined by hair-line in median fold, and terminal band purplish chocolate, a white spot in terminal band.—Hindwing dirty buff strongly suffused with grey in outer half.

Length of forewing: 13 mm.

*Hab.* Perak, 1800 ft., January 1897 (C. Curtis).

321. *Eugoa sordida* sp. nov.

♂. Antennae brown; head and thorax dirty white with mauve-grey patches; abdomen dirty buff.—Forewing white; two subbasal spots, broad antemedian and postmedian somewhat blurred transverse bands, and terminal band joined by horizontal broad streaks to postmedian band dull brown.—Hindwing buff.

Length of forewing: 15 mm.

*Hab.* Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., September 1910 (A. S. Meek).

322. *Eugoa mediopuncta mediopuncta* subsp. nov.

♂. Antennae rufous brown; head whitish cream-colour; thorax whitish cream-colour with mauve-brown patches; abdomen greyish cream.—Forewing cream;

a median black spot in median fold, an antemedian and a postmedian band pale chocolate brown; in outer third of wing are some chocolate scaling and blurred patches, some of which join postmedian band; terminal line brown.—Hindwing buff, a brown terminal line and an indistinct almost obliterated median band of brown scales.

Length of forewing: 8 mm.

*Hab.* Isabel Island, Solomon Islands, June 4—July 9, 1901 (A. S. Meek).

323. ***Eugoa mediopuncta sordidior*** subsp. nov.

♂. Larger and greyer; outer third of forewing much more suffused; hindwing suffused with grey.

Length of forewing: 11 mm.

*Hab.* Kumusi River, N.E. British New Guinea, May 1907 (A. S. Meek).

324. ***Eugoa aureoplagiata*** sp. nov.

♂. Head, antennae and thorax iridescent golden yellow; abdomen buff.—Forewing slate-grey; base, costal area and apex broadly iridescent golden yellow with an internal edging of glittering violet; a large golden yellow patch edged with and joined to a purple patch based on inner margin.—Hindwing buff.

Length of forewing: 11 mm.

*Hab.* Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek).

325. ***Trischallis iridescens iridescens*** subsp. nov.

♂. Antennae and head glittering golden yellow; thorax iridescent coppery mauve, tegulae and base of patagia glittering golden yellow; abdomen golden buff.—Forewing golden yellow; base and basal third of costa iridescent coppery mauve; an antemedian semicircular band iridescent magenta blue, from which proceeds outwards a slate-grey streak; terminal band and apex broadly iridescent coppery mauve.—Hindwing buff.

Length of forewing: 10 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5900 ft., March 1911 (A. S. Meek).

326. ***Trischallis iridescens orientalis*** subsp. nov.

♂. Differs from *i. iridescens* in being smaller, paler and duller.

Length of forewing: 7.5–8 mm.

*Hab.* Haidana, Collingwood Bay, N. British New Guinea, April 1907; Kumusi River, N.E. British New Guinea, June 1907 (A. S. Meek).

Type, Haidana.

327. ***Hemonia schistacea*** sp. nov.

♂. Antennae, head and thorax bluish slate-grey; abdomen dull buff.—Forewing bluish slate-grey; three antemedian and a median spot, a subapico-terminal arched line from costa one-third before apex to vein 1, and basal two-thirds of costa black.—Hindwing buffy white.

Length of forewing: 12 mm.

*Hab.* Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—November 1910 (A. S. Meek).

328. **Hemonia murina** sp. nov.

♀. Antennae pale brown; head and thorax mouse-grey; abdomen whitish grey.—Forewing mouse-grey; an apico-terminal band darker, median spot black.—Hindwing paler mouse-grey.

Length of forewing: 10.5–12 mm.

*Hab.* Kumusi River, N.E. British New Guinea, June–August 1907 (A. S. Meek).

329. **Hemonia schistaceoalba** sp. nov.

♂. Head, antennae, and thorax brownish slate; abdomen cream-white, anal tuft and valves whitish grey.—Forewing milk-white; base, costal area, apex, and terminal band to vein 1 slate-grey suffused with brown.—Hindwing milk-white.

Length of forewing: 11.5 mm.

*Hab.* Kumusi River, N.E. British New Guinea, June 1907 (A. S. Meek).

330. **Hemonia simillima** sp. nov.

♀. Similar to *orbiferana*, but larger. Antennae brown; head and thorax purple-slate; abdomen pale cream-buff.—Forewing purple-slate; disc wood-brown suffused with purple-slate, a discocellular stigma and large spot above vein 1 orange, two curved zigzag black lines from costa beyond middle to termen above tornus.—Hindwing pale cream-buff.

Length of forewing: 13 mm.

*Hab.* Haidana, Collingwood Bay, N. British New Guinea, April 1907; Kumusi River, N.E. British New Guinea, July 1907 (A. S. Meek).

Type, Haidana.

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The following species are out of order because they were not found to be distinct till after the bulk of the article had gone to press:

331. **Nishada fuscofascia** sp. nov.

♀. Antennae dark brown; head orange-golden; thorax purple-brown with three orange-golden patches; tegulae orange-golden with central purple-brown spot; abdomen greyish brown.—Forewing wood-brown with violet gloss, a broad postmedian band and a terminal band darker purple-brown.—Hindwing pale buffish wood-brown.

Length of forewing: 14 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, March 1911 (A. S. Meek).

332. **Nishada louisiadensis** sp. nov.

♂. Entirely testaceous buff; hindwing paler; forewing powdered with purple-brown scales, denser beyond middle, where they form an obsolescent band; a discocellular ring-like stigma brown.

Length of forewing: 13 mm.

*Hab.* Sud-Est Island, Louisiade Islands, April 1898 (A. S. Meek).

333. *Nishada aurantiaca* sp. nov.

♂. Antennae orange; head, frons orange, vertex purple-chocolate; thorax purple-chocolate, edges of tegulae orange; abdomen above purple-chocolate, anal tuft orange; from each side of second segment proceed tufts of long orange hair reaching beyond the end of abdomen.—Forewing purple-chocolate, basal two-thirds of costal area orange.—Hindwing orange, terminal band purple-chocolate.

Length of forewing: 19 mm.

*Hab.* Toli Toli, North Celebes, November—December 1895 (H. Fruhstorfer).

334. *Agylla rufifrons virago* subsp. nov.

♂. Differs from *r. rufifrons* in having the forewings sooty black, **not** greyish wood-brown, and in having the hindwings orange.

♀. Differs by the orange-buff longitudinal band below vein 1 being present, as in the ♂.

*Hab.* Horisha, Formosa.

335. *Agylla virilis* sp. nov.

♀. Resembles ♂ of *ramelana* Moore, but has the oblique postmedian band of equal width at costa and inner margin and quite black. Spots on hindwing smaller.

Length of forewing: 27 mm.

*Hab.* Horisha, Formosa.

336. *Procrimima schistacea* sp. nov.

♂. Head, antennae, thorax, and abdomen blackish slate-grey.—Forewing blackish slate-grey; costa strongly arched before the middle and then suddenly excised.—Hindwing paler slate-grey; a large pocket-like scent organ, containing long hairs and androconial scales, above vein 1.

Length of forewing: 12 mm.

*Hab.* Santo Domingo, Carabaya, Peru, 6500 ft., April 1902, dry season (G. R. Oeckenden).

337. *Narasodes fasciata* sp. nov.

♂. Head orange-buff; antennae dark grey; thorax greyish chocolate-brown; abdomen brownish grey.—Forewing orange-buff; a median somewhat oblique band and a terminal band greyish chocolate-brown.—Hindwing brownish buffy grey.

Length of forewing: 7 mm.

*Hab.* Milne Bay, British New Guinea, January 1899 (A. S. Meek).

338. *Manoba rufofasciata* sp. nov.

♀. Entirely silvery ash-grey; basal two-fifths of costa of forewing strongly arched and black, an antemedian rufous chestnut oblique band curving out towards tornus below vein 1; beyond this band are some patches of scattered black scales. There are also some patches of scattered black scales on the hindwing.

Length of forewing: 6 mm.

*Hab.* Milne Bay, British New Guinea, December 1898 (A. S. Meek).



339. *Manoba postpuncta* sp. nov.

♂. Antennae, head, and thorax snow-white; abdomen greyish white.—Forewing white; a basal, two discal, and terminal smear-like bands dirty brownish yellow.—Hindwing white with various yellowish smears and a large brown discocellular stigma.

Length of forewing : 8.5 mm.

*Hab.* Milne Bay, British New Guinea, December 1898 (A. S. Meek).

340. *Chionaema punctistrigosa* sp. nov.

♂. Antennae pale brown; head and thorax testaceous yellowish grey, thorax and base of patagia spotted with black; abdomen grey-brown, two basal segments heavily clothed with golden buff hair, anal tuft golden buff.—Forewing testaceous yellowish grey; basal two-thirds with a number of black spots, the largest running from middle of inner margin to median fold; outer third clouded with sooty grey, and with sooty grey curved and zigzag lines.—Hindwing: basal two-thirds orange-buff, outer third sooty blackish grey.

Length of forewing : 15.5 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000 ft., March 1911 (A. S. Meek).

341. *Illice unifascia* sp. nov.

♂. Antennae black; head and thorax brownish slate, tegulae orange rufous; abdomen crimson-scarlet.—Forewing brownish slate, terminal edge and outer half from inner margin to below vein 3 darker; an antemedian transverse orange-buff band expanding widely from fold below subcostal vein to inner margin.—Hindwing crimson-scarlet edged with brown-black from costa before apex to vein 2.

Length of forewing : 9 mm.

*Hab.* Muzo, Rio Cantinero, Colombia, 400 metres (A. H. Fassl).

342. *Miltochrista aureorosea* sp. nov.

♂. Head, antennae, and thorax orange golden, thorax and patagia spotted with black; abdomen, basal half buff, outer half golden orange washed with scarlet.—Forewing: basal two-thirds orange golden, outer third and inner margin scarlet; a basal dot, antemedian and median zigzag lines, a postmedian very broad band containing indications of a row of red spots, and termen brownish slate-grey.—Hindwing rose edged with slate.

Length of forewing : 11 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000—7000 ft., February 1911 (A. S. Meek).

343. *Miltochrista coccineotermen* sp. nov.

♀. Head, antennae, and thorax golden yellow, a fuscous dot on patagia; abdomen buff.—Forewing golden yellow, a broad terminal band of crimson-scarlet; two basal and a subbasal dots, antemedian and median zigzag lines, a postmedian dot, a double zigzag postdiscal line joined by two streaks to fringe, and fringe brownish slate.—Hindwing pale buff, fringe dirty grey.

Length of forewing : 11—14 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000 ft., March 1911 (A. S. Meek).

344. *Miltochrista intensa* sp. nov.

♂. Antennae scarlet; head and thorax reddish scarlet edged and spotted with slaty grey-black; abdomen buffy brown washed with dull scarlet.—Forewing scarlet, terminal fifth deep crimson carmine; costa, termen, and outer fifth of inner margin black, with large median scarlet patch on costa; basal fourth and median portion of outer half between veins 2 and 7 strongly suffused with grey slate-brown; median crossed bands with several streamers dark bluish-slate.—Hindwing salmon washed with carmine. A second male has the dark bands and suffusion much accentuated, while a third is altogether paler and has them much reduced.

Length of forewing : 16—19 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000 ft., March 1911 (A. S. Meek).

345. *Utriculifera muricolor* sp. nov.

♂. Wholly yellowy brownish mouse-grey; some spots on costa, a median dot and a terminal row of spots on forewing dark brown.

Length of forewing : 7 mm.

*Hab.* Milne Bay, British New Guinea, December 1898 (A. S. Meek).

346. *Eugoa fascirrorata* sp. nov.

♂. Antennae brown; head whitish; thorax chocolate brown, variegated with pale brown; abdomen pale yellowish wood-brown.—Forewing silvery whitish grey; broad antemedian and postmedian irregular bands, and a terminal row of dots chocolate; fringe pale brown.—Hindwing dark brown-grey.

Length of forewing : 9.5 mm.

*Hab.* Coomoolaroo, Duaringa, N. Queensland (A. S. Meek).

347. *Eugoa perfasciata* sp. nov.

♀. Very close to *fasciata* Rothsch., but white bands wider and basal one goes right through to inner margin.

Length of forewing : 10 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000 ft., March 1911 (A. S. Meek).

348. *Eugoa irregularis* sp. nov.

♂. Antennae dark brown; head and thorax white, a patch on thorax and hind edge of tegulae dark brown; abdomen mouse-grey.—Forewing white; an antemedian band, two broken postmedian irregular bands, and a terminal band dark grey-brown.—Hindwing mouse-grey.

Length of forewing : 10 mm.

*Hab.* Mount Goliath, Central Dutch New Guinea, 5000 ft., March 1911 (A. S. Meek).

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CRITICAL NOTES ON THE TYPES OF LITTLE-KNOWN SPECIES OF NEOTROPICAL BIRDS.—PART II.\*

By C. E. HELLMAYR.

IN the following lines I propose to discuss another series of type-specimens which I have had the opportunity of examining during the last six years, and it is hoped that these notes may not be devoid of interest to the student of neotropical ornithology. Acknowledgments for the loan of material are due to the same gentlemen as mentioned in the first part of this paper, and also to Dr. J. A. Allen, Mr. O. Bangs, Dr. Hans Gadow, and Mr. F. V. McConnell.

48. *Thryothorus coraya* and allies.

Among South American Wrens this is unquestionably the most puzzling and most difficult group. It embraces seven or eight races which, although sometimes separated by wide tracts of country, differ one from another only in slight, but fairly constant characters. For a long time the typical *T. coraya*, "Le Coraya de Cayenne" of Buffon and Daubenton, was the only recognised form whose range was supposed to extend over nearly the whole Amazonian subregion from French Guiana to the eastern slopes of the Andes in Ecuador and Peru. The first attempt to discriminate local races of this wide-ranging bird was made by the late R. B. Sharpe, who, in 1881, described *Thryothorus amazonicus* from the Ucayali, and *T. griseipectus* from the north bank of the Marañon.† In 1903 the present writer‡ gave a short review of the known forms, which, in the light of the ample material now at hand, requires considerable modification. Quite recently Lord Brabourne and Mr. Chubb§ have dealt with the Guianan representatives of the group, but being unfamiliar with the variation of these birds, and unacquainted with the existing literature, they have fallen into several errors, and added, furthermore, to the confusion by creating two useless synonyms.|| So much about the previous papers relating to the subject.

The careful study of a large series leaves no doubt that *T. coraya*, *T. ridgwayi*, *T. amazonicus*, *T. griseipectus*, *T. griseipectus caurensis*, *T. herberti*, and *T. cantator* are merely representatives of the same specific type, agreeing with one another in all essential points, and replacing each other geographically. It is probable that *T. albiventris* Tacz.¶ also belongs to this group; unfortunately I have not been able to secure an example of this rare species.

The total of specimens examined in the present connection amounts to seventy-two—certainly a far greater number than has yet been at the disposition of any

\* Part I; *Nov. Zool.* xiii. 1906, pp. 305-52.

† *Cat. B. Brit. Mus.* vi. pp. 235, 236.

‡ *Journ. für Ornith.* 51, pp. 532-4.

§ *Ann. Mag. Nat. Hist.* (8 ser.) x. August 1912, pp. 261-2.

|| In the same paper the authors propose the new name *Pteroglossus raraimae*, which, again, is only a synonym of *P. aracari atricollis* (P. L. S. Müll.). See Berlepsch & Hartert, *Nov. Zool.* ix, 1902, p. 102; Berlepsch, *Nov. Zool.* xv, 1908, p. 281; Hellmayr, *Lc.* xvii, 1910, p. 397.—The record of *Thamnophilus borbae* from British Guiana is likewise a mistake, the birds from that country being referable to *T. major semifasciatus* (Cab.), which has a wide range in northern South America.

¶ *P. Z. S. Lond.* 1882, p. 5 (1882.—Chirimoto, N. Peru).

monographer. Before proceeding to the account of the various races it may be stated that adult males and females do not differ in coloration; the latter are, however, smaller, and have a shorter, slenderer bill. Young birds of both sexes are much more brownish beneath, the white markings on the sides of the head are dingy, ill-defined, sometimes even obsolete, the upper parts duller as well as darker, etc.

SYNOPSIS OF THE SUBSPECIES OF *Thryothorus coraya*.

1. *Thryothorus coraya coraya* (Gm.).

*Turdus Coraya* Gmelin, *Syst. Nat.* 1, ii. p. 825 (1789.—based on "Le Coraya de Cayenne," Daubenton, Pl. enl. 701, fig. 1, and Buffon, *Hist. Nat. Ois.* iv. p. 454).

*Thryothorus melanos* Vieillot, *Nouv. Dict.* 34, p. 56 (1819.—"Bresil"; coll. Laugier).

*T. oyapocensis* Ridgway, *Proc. U.S. Mus.* x. 1887, p. 516, note (1888.—Oyapoc, Cayenne).

*T. coraya* Pelzeln, *Zur Orn. Bras.* i. p. 48 (part.: Barra do Rio Negro); Berlepsch, *Nov. Zool.* xv. 1908, p. 106 (Approuague, Ipousin, French Guiana).

*T. coraya coraya* Hellmayr, *Journ. f. Orn.* 51, 1903, p. 532 (part.: Cayenne).

*T. coraya herberti* (error!) Hellmayr, *Journ. f. Orn.* 51, 1903, p. 533 (part.: specimen ex Barra do Rio Negro).

*T. oyapocensis oyapocensis* Brabourne & Chubb, *Ann. Mag. Nat. Hist.* (8) x. 1912, p. 262 (French Guiana).

*Hab.* French Guiana: Cayenne, Ipousin, Approuague (Cherrie), Oyapoc (Jelski), Saint-Jean-du-Maroni (Le Moutt); Surinam: near Paramaribo (Chunkoo). North Brazil: Barra do Rio Negro [= Manáos] (Natterer).

*Adult.*—Upper parts rufous brown, duller on crown and nape; upper tail-coverts dull rufescent brown, either uniform or with traces of dusky cross-lines; rectrices regularly barred with blackish and greyish brown or dingy grey, the light bars towards the base of the tail often slightly tinged with fulvous. Sides of head and neck black, varied with numerous well-defined white shaft-stripes; a very distinct superciliary line white. Below: throat and foreneck white, the latter tinged with pale greyish; middle of breast and abdomen dull greyish white or dingy buffish, chest clouded with brownish; sides of the body extensively fulvous-brown; under tail-coverts somewhat paler, barred with dusky.

*Juv.*—Differ by having the sides of the head sooty blackish with obsolete, greyish white markings; the crown and nape brighter rufous brown; the throat more greyish, the foreneck smoky grey, and the remainder of the under parts nearly uniform fulvous brown, there being but a few buffy white feathers in the middle of the breast. The basal half of the lower mandible is bright yellow, abruptly defined against the blackish tip, while in adult birds the under bill is wholly horn-grey.

*Material.*—1 ♂ ad. Barra do Rio Negro, 10 from French Guiana, 1 imm. from Surinam. Specimens from different localities average as follows:

Four adult males from Cayenne (French Guiana) . . . . .	Wing 59–61; tail 53–56; bill 17–18 mm.
One adult male from Barra do Rio Negro, Brazil . . . . .	Wing 62; tail 57; bill 16 mm.
One adult female from Cayenne . . . . .	Wing 58; tail 53; bill 17 mm.
One immature (not sexed) from Surinam . . . . .	Wing 59; tail 57; bill 15½ mm.

*Observations.*—The series from Cayenne and Surinam is fairly uniform. An adult male from Saint-Jean-du-Maroni is rather lighter rufous on the back, approaching *T. c. amazonicus*, though otherwise it is quite typical. The single

Brazilian specimen, a perfectly adult male, agrees in every way with Cayenne skins and belongs undoubtedly to the present race. It is one of the two examples referred to as *T. coraya herberti* Ridgw. in my paper quoted above. How this mistake could have been committed I am at a loss to understand. In fact, the Manaós specimen differs from that taken at Cara-raucú (which will be discussed later on) by much darker, more chestnut-brown upper parts, dingy grey (instead of cinnamon-brown) tail, more extended as well as much brighter fulvous-brown colour on the sides of the body, distinct white markings on the cheeks and ear-coverts, and by having the chest clouded with brownish. In all these characters it is practically identical with Cayenne examples. *T. c. coraya* ranges, therefore, from French Guiana south to the north bank of the Amazons.

*Nomenclature*.—Messrs. Brabourne and Chubb accept for the Cayenne bird the name *T. oyapocensis* Ridgw., under the assumption that Daubenton's plate represents the race from the Roraima Mountains in British Guiana. However, this view cannot be upheld for several reasons. Firstly, on reference to Buffon's work\* we find that the description of "Le Coraya" † evidently applies to the ordinary Cayenne bird, which, moreover, is the only Wren of this group occurring in the French colony. Secondly, the interior of British Guiana was literally unknown at the time of Buffon's writing; and it was not until 1842 that Richard Schomburgk, as the first European traveller, reached the distant mountain chain of which Roraima is the culminating peak. Daubenton's figure with uniform fulvous-brown belly might well have been taken from a young bird in which, as said above, the greyish white middle line is nearly wanting.

## 2. *Thryothorus coraya griseigula* (Lawr.).

*Formicivora griseigula* Lawrence, *Ann. N.Y. Acad. Sci.* ii. no. 12. p. 382 (June 1883.—British Guiana); Allen, *Bull. Amer. Mus. N.H.* ii. 1889, p. 151 (juv.).

*Thryothorus coraya* (nec Gmelin) Cabanis in: Schomburgk, *Reisen Brit. Guiana* iii. 1848, p. 674 ("Küstenwälder," Brit. Guiana); Sharpe, *Cat. B. Brit. Mus.* vi. p. 234 (part., descr. and hab. Bartica Grove); Salvin, *Ibis*. 1885, p. 201 (Bartica Grove, Merumé, Roraima Mts.).

*T. ridgwayi* Berlepsch, *Journ. f. Orn.* 37, p. 293 (1889—Brit. Guiana; the type is from Bartica Grove); Hellmayr, *l.c.* 51, 1903, p. 534 (crit., Bartica Grove [type], Camacusa).

*T. coraya berlepschi* Brabourne and Chubb, *Ann. Mag. Nat. Hist.* (8) x. p. 262 (1912.—Bartica Grove).

*T. oyapocensis ituribisciensis* Brabourne and Chubb, *l.c.* p. 262 (Ituribisce, Brit. Guiana).

*Hab.* British Guiana: Bartica Grove, Merumé Mountains, Roraima, Carimang River, Camacusa (H. Whitely), Supernaam, ‡ Camacabra Creek, Ituribisce § (F. V. McConnell).

*Adult*.—Much like *T. coraya coraya*, but differs by having the under parts (except throat and foreneck) strongly washed with ochreous brown or tawny ochraceous. In all other characters, viz. rufous brown colour of upper parts, greyish brown tail-bands, distinct white stripes on sides of head, etc., it closely resembles the typical race.

*Juv.*—Breast and abdomen uniform rufous-brown, much darker than in the corresponding stage of *T. c. coraya*.

*Material*.—1 ♂ ad. (type of *T. ridgwayi*), 1 ♀ vix ad. (type of *T. coraya ber-*

\* *Hist. Nat. Ois.* iv. p. 484.

† "La gorge et le devant du cou sont blancs, la poitrine est moins blanche et prend une teinte de cendré; il y a un peu de roussâtre sous le ventre et sur les jambes."

‡ Spelt "Supinaam" on the map in R. Schomburgk's *Reisen in British Guiana*, vol. ii. Leipzig, § Spelt "Itterbiesje" 1847.

*lepsi*), 1 ♀ imm. from Bartica Grove; 1 ad. Great Falls; 1 Camacabra Creek; 4 Supernaam; 4 Ituribisce; 8 ♂ ♀ Roraima; 1 ♀ ad. Camacusa; 1 ♂ vix ad. R. Carimang.

Specimens from different localities average as follows :

Six males from the coast district (Bartica, etc.) . . . . .	Wing 60-63; tail 56-58; bill 15-16 mm.
Two males from the mountains (Carimang, Roraima) . . . . .	Wing 61; tail 59, 62; bill 15, 16 mm.
Six females from the coast district . . . . .	Wing 57-59; tail 53-56; bill 15-16 mm.
Six females from the mountains (Camacusa, Roraima) . . . . .	Wing 55-57; tail 52-57; bill 15 mm.

*Observations.*—Messrs. Brabourne and Chubb, in the paper quoted above, distinguish three races as occurring in British Guiana under the names of *T. coraya coraya* (Roraima), *T. c. berlepsi* (Bartica Grove), and *T. oyapocensis ituribisciensis* (Ituribisce district). Mr. F. V. McConnell very kindly forwarded for my inspection his entire series of Wrens which had formed the basis of their conclusions. This material, supplemented by the specimens in the Munich, Tring and Berlepsch Collections, and including the types of *T. ridgwayi*, *T. berlepsi*, and *T. o. ituribisciensis* I have carefully studied, with the result that I find there exists in British Guiana but one form, which is entitled to the name *T. c. griseigula* (Lawr.).

Let us first consider the inhabitants of the lowland districts, which, according to Brabourne and Chubb, are referable to two races, one with dull fulvous underparts (*T. c. berlepsi*), the other with greyish middle line (*T. o. ituribisciensis*). On comparing fifteen specimens I notice that three from Bartica Grove (including the types of *T. ridgwayi* and *T. berlepsi*), and an adult male from Supernaam are much the darkest, the under parts posterior to the white throat and foreneck being nearly uniform bright tawny ochraceous. Then follow two skins from the "Great Falls" and Camacabra Creek with a somewhat duller, more brownish ochraceous belly, which in the last-named bird passes into a paler, more brownish buff tinge along the middle line. Next come two males from Ituribisce (one the type of *T. o. ituribisciensis*) in which the under parts are mainly buffy brown, darkening to ochreous brown on the flanks. An adult bird from Supernaam is closely similar, but the middle of the abdomen is rather more greyish brown and the sides are decidedly darker. Finally, two males (adult and immature) from Supernaam and Ituribisce are even more greyish in the middle, and, except for the slightly darker sides, they are not distinguishable from average Cayenne specimens, i.e. *T. c. coraya*. From the above, it will be seen that the variation is purely individual and not connected with any particular geographic area. It should also be borne in mind that the Ituribisce is in the same district as the Supernaam, both rivers draining their waters through the plains into St. James' Canal (mouth of the Essequibo). The conditions for the development of a peculiar form are, therefore, hardly given.

Messrs. Brabourne and Chubb, furthermore, consider the birds from the mountainous interior (Roraima) to be distinguishable by their lighter "chestnut" back and brighter fulvous underparts. The majority of my skins from the mountains are indeed of a clearer ochraceous beneath, but several are not different from the type of *T. ridgwayi* (ex Bartica Grove), whereas a male from the Carimang River (Roraima district), in the dull ochreous-brown belly, exactly matches some of the

lowland examples. In the shade of the upper parts I cannot discover any constant difference between the two series. Adult Roraima birds are by no means lighter rufous brown than those from Bartica Grove or Supernaam, and for the present I am unable to discriminate more than one form in British Guiana.

Thus, *T. c. griseigula* may be characterized as being similar to *T. c. coraya*, but as a rule easily distinguishable by the ochraceous or ochreous brown colour of the lower parts, though occasionally specimens may be found which closely resemble the typical race.

*Nomenclature.*—The earliest available name is apparently *Formicivora griseigula*, founded upon an immature example from British Guiana. The description leaves no doubt as to its identity, which, moreover, has been confirmed by Dr. J. A. Allen through examination of the type specimen.

### 3. *Thryothorus coraya herberti* Ridgw.

*Thryothorus herberti* (Riker MS.) Ridgway, *Proc. U.S. Mus.* x. 1837, p. 516 (1888.—Diamantina, near Santarem, Lower Amazons); Chapman and Riker, *Auk*, vii. 1890, p. 266 (Diamantina).

*T. coraya herberti* Hellmayr, *Journ. f. Orn.* 51. 1903, p. 533 (part.: Cara-raucú).

*T. coraya* (errore) Pelzeln, *Zur Orn. Bras.* i. p. 48 (part.: Cara-raucú, Lower Amazons).

*Hab.*—North Brazil, south bank of the Lower Amazons: Diamantina, near Santarem (Riker), Cara-raucú (Natterer).

*Adult.*—Nearest to *T. coraya coraya*, from Cayenne and Manãos, but differs by having the sides of the head almost uniform black (relieved only by a very narrow, inconspicuous, white superciliary streak and a few extremely narrow lines of the same on auriculars); the upper parts much brighter, more chestnut rufous; the light tail-bands cinnamon-brown instead of dull greyish; the foreneck and chest more purely buffy grey without brownish suffusion; and the flanks less extensively as also paler rufescent brown.

*Material.*—One ♂ ad. from Cara-raucú, Lower Amazons, J. Natterer coll., Vienna Museum. Wing 62; tail 58; bill 16½ mm.

*Observations.*—This specimen agrees very well with Mr. Ridgway's description, and appears to be decidedly distinct from *T. c. coraya*. The pileum and nape are dull sepia brown, slightly tinged with amber or rufescent, the remaining upper parts, including wing- and tail-coverts, bright chestnut rufous. Underneath it resembles the Cayenne form, but the breast is somewhat paler and lacks the brownish suffusion, while the flanks are lighter brown. There is, however, no difference between the two races either in size or in the shape of the bill. From *T. coraya amazonicus*, of Upper Amazonia, *T. c. herberti* may be distinguished by the reduction of the white markings on sides of head, by the cinnamon-brown (instead of dull greyish) tail-bands and by the bright chestnut-rufous upper parts. Seen from below the two races are perfectly alike.

### 4. *Thryothorus coraya amazonicus* Sharpe.

*Thryothorus amazonicus* Sharpe, *Cat. B. Brit. Mus.* vi. p. 235, tab. 15, fig. 1 (1881.—Sarayaçu, Ucayali, Eastern Peru); Berlepsch, *Journ. f. Orn.* 37, 1889, p. 293 (Yurimaguas).

*T. coraya amazonicus* Hellmayr, *Journ. f. Orn.* 51, 1903, p. 533 (crit.: Yurimaguas).

*T. coraya* (errore) Sclater and Salvin, *P.Z.S. Lond.* 1866, p. 178 (part.: Sarayaçu); iidem, *l.c.* 1873, p. 257 (part.: Sarayaçu); Taczanowski, *P.Z.S.* 1882, p. 5 (Yurimaguas).

*Hab.*—Northern Peru, south of the Marañon: Sarayaçu, Ucayali R. (Bartlett); Yurimaguas, Huallaga R. (Stolzmann, Garlepp).

*Adult.*—Much like *T. c. coraya*, and only distinguishable by its lighter, rufous-brown upper parts and less rufescent-brown flanks. The bill is by no means

stronger than in adult birds of *T. c. coraya*, and the dusky barring of the upper tail-coverts upon which Dr. Sharpe and Count Berlepsch laid much stress is not a constant feature either. The light-coloured tail-bands are dingy greyish or ashy, only the basal ones slightly tinged with fulvous, exactly as in *T. c. coraya*, with which *T. c. amazonicus* also agrees in having a very distinct superciliary stripe and numerous white longitudinal streaks on the ear-coverts.

*Material*.—1 ♂, 1 ♂ imm. from Sarayaçu, Bartlett coll., in British (*type*) and Tring Museums; 1 ♂ ad. Yurimaguas, G. Garlepp coll., Mus. H. v. Berlepsch.

Two males from Sarayaçu . . . . . Wing 69,61; tail 61,51; bill 18,17½ mm.  
One male from Yurimaguas . . . . . Wing 62; tail 56; bill 17½ mm.

*Observations*.—The type (from Sarayaçu) and the Yurimaguas specimen have the foreneck and chest pale greyish white, clouded with brownish (like *T. c. coraya*), while the second (immature) male from the Ucayali shows a distinct buff wash all over the middle of the belly. The upper tail-coverts are nearly uniform rufous-brown in the Yurimaguas bird, but strongly barred with blackish in the two Sarayaçu skins.

##### 5. *Thryothorus coraya cantator* Tacz.

*Thryothorus cantator* Taczanowski, *Proc. Zool. Soc. Lond.* 1874, p. 130 (1874.—Amable Maria, Montaña de Vitoc, Central Peru); *idem*, *l.c.* p. 504 (Amable Maria); Berlepsch and Stolzmann, *P.Z.S.* 1896, p. 328 (La Merced, La Gloria, Central Peru; two ♀ ♀).

*Hab*.—Central Peru, dept. Junin: Amable Maria (Jelski), La Merced, La Gloria (Kalinowski), Chanchamayo (Schnuke).

*Adult*.—Differs from *T. coraya amazonicus* by lacking the white streaks on sides of head, and by having the tail-bands bright cinnamon-brown (instead of dull ashy or brownish grey). The white superciliary stripe is barely indicated by a few minute, obsolete lines above the auricular region.

*Material*.—1 ♂ ad., 1 ♀ imm. from Chanchamayo, obtained by Mr. C. O. Schunke in February 1909, in the Zoological Museum of Munich.

♂ ad. Wing 65; tail 56; bill 15 mm.

♀ imm. Wing 64; tail 57½; bill 16 mm.

*Observations*.—The two specimens agree in general coloration with the preceding race. The back and outer margins of the remiges show exactly the same light (cinnamon) rufous-brown tinge; the foreneck is pale greyish buff, passing into a purer buffy along the middle of the abdomen; the sides are clear fulvous brown. From *T. coraya herberti* they may be distinguished by the much paler rufous upper parts and flanks, as also by the greater reduction of the white markings on the "mask," the auriculars being quite uniform blackish and the superciliary line barely visible.

##### 6. *Thryothorus coraya griseipectus* Sharpe.

*Thryothorus griseipectus* Sharpe, *Cat. B. Brit. Mus.* vi. p. 236. tab. 15. fig. 2 (1881.—N.E. Peru: Nauta [*type*], Pebas, Loretoyacu; Eastern Ecuador: Sarayaçu); Taczanowski, *Orn. Pérou*, i. 1884, p. 517 (Iquitos, Nauta, Pebas, etc.); Goodfellow, *Ibis*, 1901, p. 313 (Archidona, E. Ecuador).

*T. coraya* (errore) Sclater, *P.Z.S.* 1858, p. 64 (Rio Napo, East Ecuador); Pelzeln, *Zur Orn. Bras.* i. 1867, p. 48 (part.: Rio Negro betw. S. Isabel and Castanheiro, Marabitanas, Rio Içanna); Sclater and Salvin, *P.Z.S.* 1866, p. 178 (part.: Nauta); *idem*, *l.c.* 1867, p. 977 (Pebas); *idem*, *l.c.* 1873, p. 257 (part.: Nauta, Pebas).

*T. coraya coraya* (errore) Hellmayr, *Journ. f. Orn.* 51, 1903, p. 532 (part.: Marabitanas, Rio Içanna, Rio Negro).



*Hab.* North-eastern Peru, north bank of the Marañon ; Nauta (Bartlett), Pebas, Rio Tigré (Hauxwell), Iquitos (Whitely) ; Eastern Ecuador : Rio Napo (Verreaux), Archidona (Goodfellow), Catapino (Petit), Sarayaçu (Buckley) ; N.W. Brazil, Rio Negro district : Marabitanas, R. Içanna, between S. Isabel and Castanheiro (Natterer).

*Adult.*—Differs from *T. c. coraya* and *T. c. amazonicus* by much darker chestnut-brown upper parts ; pale fulvous (instead of greyish brown) tail-bands ; by having the lower surface posterior to the throat distinctly ashy grey, without any brownish suffusion on the chest, the sides of the body alone being dark russet brown. Size generally less, especially the bill weaker and slenderer.

*Material.*—5 ♂♂, 2 ♀♀, Nauta (including the type), in British and Tring Museums ; 1 ♀ ad., Pebas, Brit. Museum ; 2 ♂♂ ad., Rio Tigré, Mus. H. v. Berlepsch ; 1 ♂ ad., Catapino, 1 ♀ imm., Archidona, in Tring Museum ; 3 ad. (not sexed), Sarayaçu, in Brit. and Berlepsch Museums ; 4 ♂♂ ad., 1 ♀ ad., 1 ♀ jr., Upper Rio Negro (Marabitanas, Içanna, Castanheiro), Natterer coll., in Vienna and Munich Museums.

Specimens from different localities average as follows :

Four males from Nauta . . . . .	Wing 63-65 ; tail 55-60 ;	bill [damaged].
Two females from Nauta . . . . .	Wing 59, 60 ; tail 50 ;	bill [damaged].
Two males from Rio Tigré . . . . .	Wing 60, 64 ; tail 51, 56 ;	bill 17 mm.
Two males from Eastern Ecuador	Wing 62, 65 ; tail 55, 57½ ;	bill 18 mm.
One female from Eastern Ecuador	Wing 59 ; tail 53 ;	bill 16 mm.
Four males from the Upper Rio Negro . . . . .	Wing 58-61 ; tail 50-55 ;	bill 15-16 mm.
Two females from the Upper Rio Negro . . . . .	Wing 57 ; tail 47 ;	bill 14½-15 mm.

*Observations.*—The typical Peruvian birds when compared with a series from Cayenne are much deeper, chestnut brown above, and have the median portion of the breast and abdomen more decidedly ashy grey, the chest being by no means clouded or washed with brownish. The sides of the belly are extensively and dark rufous brown, as in *T. c. coraya*, but the upper tail-coverts are much darker, without traces of dusky barring. There is a very distinct white superciliary stripe, also the sides of the head are strongly streaked with white. Birds from Eastern Ecuador are practically identical with the Peruvian ones. The series from the Rio Negro, however, differ slightly : they are smaller, with the bill notably so, and the upper parts are still deeper chestnut brown. In the small size they agree with *T. c. caurensis*, but have much more rufous-brown on the flanks. In a previous communication on this subject I have referred them to *T. c. coraya*, from which they are, however, obviously distinct.

All the above examples are distinguished by having the tail-bands light fulvous (that is, neither bright cinnamon as in *T. c. herberti*, nor dull greyish brown as in *T. c. coraya*). The upper mandible is black, the lower one horn-grey with light tip.

#### 7. *Thryothorus coraya caurensis* Berl. and Hart.

*Thryothorus griseipectus caurensis* Berlepsch and Hartert, *Nov. Zool.* ix. p. 7 (1902.—Nicare, Caura River, East Venezuela).

*Hab.* Eastern Venezuela, Caura Valley : Nicare, La Pricion (E. André).

*Adult*.—Agrees in all essential characters with *T. c. griseipectus*, but the whole of the lower parts (except throat) is ashy grey, only the innermost sides of the belly being much paler russet-brown.

*Material*.—8 ♂♂, 4 ♀♀ from the Caura (including the type), six in the Munich, five in the Tring Museum.

Eight males . . . . . Wing 61–64 ; tail 50–55 ; bill 16½–18 mm.  
Four females . . . . . Wing 56–58 ; tail 45–49 ; bill 15–16 mm.

*Observations*.—I am not very confident as to the distinctness of this form, which additional material from intervening countries may prove to be inseparable from *T. c. griseipectus*, although the twelve Caura specimens have certainly less rufescent-brown suffusion on the flanks. The alleged difference in the colour of the lower mandible does not exist. The original describers were deceived by the defective state of the Nauta specimens, all of which had lost the corneous tegument of the bill. In fresh skins from Peru and Ecuador the under mandible is horny grey, with lighter tip, exactly as in the Caura series.

#### 49. *Cyclarhis atrirostris* ScL. = *Cyclarhis nigrirostris* Lafr. juv.

*Cyclarhis nigrirostris* Lafresnaye, *Rev. Zool.* v. p. 133 (1842.—“in Colombia,” sc. Bogotá).

*Cyclarhis atrirostris* Sclater, *Ibis* (5) v. p. 324. tab. x. (1887.—Ecuador, Buckley coll., type in British Museum).

No 1. Mus. Brit. “♂ juv. Camino de Manabi, Ecuador, C. Buckley coll. e Musco Salvin and Godman.” Type of *C. atrirostris* ScL.

Wing 79 ; tail 67 ; bill 17 mm.

The careful comparison of the type specimen with a large series from Colombia, (Bogotá, Antioquia) and Ecuador proves it to be a very young example of *C. nigrirostris*. Unmistakable signs of immaturity are the pale cinnamon tips to the greater upper wing-coverts, the pointed rectrices, and the peculiar texture of the feathers on the flanks and crissum. Moreover, the pileum is still covered with the characteristic, fluffy, dull reddish cinnamon feathers of the nestling, which extend, in a wide stripe, over the temporal region to the sides of the nape. Dr. Sclater mistook these stripes for “superciliaries,” while, in fact, they are but remains of the juvenile plumage. The real superciliary streak, indicated by several dark chestnut feathers, is by no means more extended than in average specimens of *C. nigrirostris*, reaching as far as the posterior border of the eye. Newly-grown feathers that are to be observed here and there between the rufous ones have exactly the same colour as in adult *C. nigrirostris*, being cinereous on the forehead, bright green on the crown and temporal region. The coloration of the under parts agrees minutely with that of adult birds, except that the inner margin of the remiges is somewhat brighter yellow. The bill lacks the abruptly defined pale basal spot, the corresponding portion of the mandible being dark brown, but slightly lighter than the black apical half. An immature Bogotá skin in the Munich Museum is intermediate in that respect.

*C. atrirostris* must, therefore, be relegated to the synonymy of *C. nigrirostris*, since constant differences between Ecuadorian and Colombian specimens do not appear to exist. Generally birds from Bogotá and Eastern Ecuador (Baeza) have rather smaller bills than those from Western Ecuador (Gualaes, Milligalli), but there are numerous exceptions to these rules. In coloration they are perfectly alike. Specimens from different localities average as follows :

Five adults from Bogotá . . . .	Wing 74-75; tail 62-65; bill 15-16½ mm.
Three adults from Antioquia (Santa Elena) . . . . .	Wing 75-79; tail 63-67; bill 16-18 mm.
One adult male from Baeza, East Ecuador . . . . .	Wing 79; tail 65; bill 17 mm.
One adult female from Baeza, East Ecuador . . . . .	Wing 75; tail 62; bill 16 mm.
Two adult males from Western Ecuador (Gualea, Milligalli) . . . . .	Wing 76, 77; tail 63, 64; bill 17-18 mm.

50. *Hylophilus brunneus* Allen = *Myrmotherula schisticolor sanctae-martae* Allen ♀!

[*Formicivora schisticolor* Lawrence, *Ann. Lyc. N. H.* viii. p. 173 (1835—Turrialba, Costa Rica).]

*Myrmotherula sanctae-martae* Allen, *Bull. Amer. Mus. N. H.* xiii. p. 160 (1900.—Valparaiso, Santa Marta, Colombia; descr. ♂ ad.)

*Hylophilus brunneus* Allen, *I. c.* p. 171 (1900.—Las Nubes, Santa Marta, Colombia; descr. ♀).

No. 1. American Museum Nat. Hist. No. 70,572 "♀" ad. Las Nubes, Colombia, December 14, 1898. Santa Marta Expedition 1898-99. Type of *Hylophilus brunneus* Allen.

Wing 57½; tail 41; bill 14 mm.

This specimen is, without doubt, a female of *M. s. sanctae-martae*, and agrees in every particular with an example from Los Palmales, Andes of Cumaná (Bermudez, N.E. Venezuela) in the Tring Museum. In both, the lower surface of the body is dull ochraceous, darkening to brownish on the sides, but the type has the throat of a rather brighter tinge. The forehead, lores and sides of face are conspicuously washed with ochreous, the back is greyish olive, the wing-coverts and remiges are edged with olive-brown, exactly as in the Venezuelan bird. The maxilla is blackish, the mandible dingy horny whitish.

Venezuelan specimens measure as follows: wing 56-58½; tail 39-42; bill 13-14 mm. Thus, it will be seen that there is no difference in size either.

*M. schisticolor sanctae-martae* is as yet only known from the Caribbean Coast-mountains of Venezuela and Colombia. Cfr. Hellmayr and Seilern, *Archiv f. Naturg.* 78, Abt. A. Heft. 5, September 1912, pp. 124-5.

51. *Chlorospingus canipileus* Chapm. = *Basileuterus griseiceps* ScL. & Salv.

*Basileuterus griseiceps* ScLeter & Salvin, *P. Z. S. Lond.* 1868, p. 170 (1868.—"Venezuela, in sylvis Caripensis," sc. Caripé, Andes of Cumaná, Bermudez, N.E. Venezuela).

*Chlorospingus (Hemispingus) canipileus* Chapman, *Bull. Amer. Mus. N.H.* xii. p. 153 (Aug. 1899.—Los Palmales, Andes of Cumaná).

No. 1. Amer. Mus. Nat. Hist. No. 70,349. Adult (not sexed). Orig. label: "3. Dec. 1898, Los Palmales, No. 36. Shot in low, dense scrub on border of forest, generally met in pairs. Iris brown." Type of *Chlorospingus canipileus* Chapm.

Wing 63½; tail 61½; bill 15½ mm.

This bird is practically identical with the type in the British Museum and two others from the same district at Tring. The wing varies from 61 to 64, the tail measures 60, the bill 15 mm. None of the specimens being sexed, I cannot say whether there is any sexual difference in size, but as far as coloration is concerned the four skins\* agree very well together.

*B. griseiceps* appears to be most nearly allied to *B. leucoblepharus*, from Southern Brazil and Paraguay. In both species, the crown and nape are dark

\* I am not aware of the existence of other specimens than the above.

cinereous, the sides of the head are exactly alike, and the legs pale fleshy brown. The Venezuelan bird differs, however, at a glance by the deep yellow (instead of white) under parts.

*Chlorospingus reyí* Berl.\* bears a remarkable likeness to *B. griseiceps*, but may be distinguished by its less depressed, more curved bill, by the absence of rictal bristles, by lacking the blackish mixture about the forehead, the white supra-loral-streak and chin-spot, as well as by having the sides of the head olive-yellow (not cinereous). There are two specimens of this rare species in the Tring Museum: an adult female from El Escorial, February 20, 1896, and an adult bird from Mérida, without date and sex, obtained by S. Briceño.

52. *Chlorospingus flaviventris* Scl. = *Tachyphonus luctuosus* Lafr. & D'Orb. ♀ ad.  
*Tachyphonus luctuosus* Lafresnaye & D'Orbigny, Syn. Av. i. in: *Mag. Zool.* 1837, cl. ii, p. 29 (1837.—Guarayos, Bolivia).  
*Chlorospingus flaviventris* Sclater, *P. Z. S. Lond.* xxiv. 1856 p. 91 (July 1856.—Trinidad [Mus. Jardine]; Bolivia? [Mus. Strickland]).

There has been considerable uncertainty about the name *C. flaviventris*, which was originally based upon two specimens: one from Trinidad in Sir William Jardine's possession, and another supposed to be from Bolivia in the Strickland Collection. The former is apparently lost, it being neither in the British nor in the Tring Museum, while the second example is still preserved in the Cambridge Museum, whence it has been kindly forwarded for my inspection by Dr. Hans Gadow. It is a skin in good condition, labelled as follows: "Coll. H. E. Strickland, No. 943 b. *Tachyphonus luctuosus*, Catalogue p. 194." The inscription (in Strickland's own handwriting) of the old label reads: "Arremon-Chlorospingus. Hab. Brazil? Date 1852. Obt<sup>d</sup>. from Argent," and on the back: "*C. flaviventris* new. *Arremon* No. 107 a."

Its dimensions are: wing 63; tail  $57\frac{1}{2}$ ; bill  $12\frac{1}{2}$  mm.

This example, which answers exactly to Sclater's original description, agrees with several females of *T. luctuosus* from Bolivia, except in being slightly larger, with a somewhat longer, slenderer bill, and in having the crown rather clearer cinereous. These insignificant differences are no doubt individual. It appears to be one of Bridges' skins, showing the same handsome "make-up" as several Bolivian specimens, obtained by that traveller, in the British Museum.

Salvin † identified *C. flaviventris* with *C. albitempora* Lafr., considering No. 956 a of the Strickland Collection as the specimen referred to by Dr. Sclater. Dr. Gadow having obligingly sent me the bird in question, ‡ I can positively state that this is a mistake. Dr. Sclater says of *C. flaviventris*: "capite cinereo, viridi paulum apparente" and "gula albescenti-cinerea, abdomine toto flavo"; whereas No. 956 a has the top and sides of the head dark coffee-brown, the throat bright isabelline, and the whole middle of the belly white, the flanks only being dull yellowish olive-green! It is, therefore, evident that No. 956 a cannot have been one of the types of *C. flaviventris*. But it does not belong to *C. albitempora* either, differing by its isabelline (not whitish) throat, more buffy yellow chest-band, and paler, less blackish crown. In all these particulars it closely resembles the type of *C. fulvicularis* Berl., § forwarded for examination by my friend Count Berlepsch,

\* *Ibis* (5) iii. p. 288 (1885.—Mérida, Western Venezuela).

† *Catalogue of the Strickland Collection*, Cambridge, 1882, p. 196.

‡ It is inscribed as follows: "*Chl. albitempora*, Catalogue p. 196, No. 956 a." On the old Strickland label we read: "Brazil? 1852. Obt<sup>d</sup>. from Argent. New? *Chlorospingus*—proposed to be *fulvicularis*."

§ *Journ. f. Ornith.* 49, p. 86 (1901.—Samaipata and S. Jacinto, Eastern Bolivia).

and unquestionably refers to the same species. The preparation of the skin is that of Bridges' Bolivian specimens.

*C. flaviventris* must, accordingly, be added to the synonymy of *Tachyphonus luctuosus* (Lafr. & D'Orb.).

53. *Emberiza obscura* Lafr. & D'Orb. should be *Catamenia obscura* (Lafr. & D'Orb.)

*Emberiza obscura* Lafresnaye & D'Orbigny, Syn. Av. i. in *Mag. Zool.* 1837, cl. ii. p. 81 (1837.—Chiquitos, Bolivia; descr. juv.).

*Spermophila obscura* Taczanowski, *P.Z.S. Loud.* 1874, p. 519 (1874.—Paltaypampa, Central Peru).

No. 1. Muséum d'Hist. Nat. Paris. Juv. (skin) labelled: "No. 313, D'Orbigny 1834, D. no. 236. Chiquitos." Type of *Emberiza obscura* Lafr. & D'Orb.

Wing 53; tail 43; bill  $9\frac{1}{2}$  mm.

This specimen agrees exactly with the original description, save in the total length, which is only  $11\frac{1}{2}$  cm, instead of  $12\frac{1}{2}$  as given by Lafresnaye and D'Orbigny. In coloration of the upper parts it closely resembles an adult male from Viña, Marañon, North Peru, in the Tring Museum. The pileum and back are light brown, with a hardly perceptible olive tinge, but the upper tail-coverts are somewhat duller, and the rufescent edges to the median and greater wing-coverts so conspicuous in the Viña bird are barely indicated in the type specimen. The throat and foreneck (still covered with the fluffy feathers of the juvenile plumage) are decidedly darker than in adults of *S. obscura*, being dingy smoky brownish, with the greyish basal portion showing through. The sides of the body appear to be slightly brighter fulvous brown, while the upper mandible is somewhat paler horny brown.

These small differences are, no doubt, due to immaturity, and I think there can be no question that *E. obscura* is merely a young bird of the species called *S. obscura* nearly forty years afterwards. Structure and general style of coloration are exactly the same as in a considerable series of the last-named species. Seen from below, the type bears a certain likeness to the female of *Tiaris fuliginosa* (Wied),\* but may be easily distinguished by having the middle of the belly extensively white and the inner margin to the remiges rufous-buff (instead of whitish), by its shorter tail, as also by its much smaller, less convex bill.

On comparing twelve adult specimens from various localities (2 Bolivia; 1 Callacate, N.W. Peru; 4 Marañon, N.E. Peru; 4 Chimbo, S.W. Ecuador; 1 Paramba, N.W. Ecuador), I fail to see any differences connected with geographical distribution, and can no longer recognise the northern form *S. obscura pauper* (Berl. and Tacz.).† At all events, birds from N.E. Peru which are certainly *S. obscura* Tacz. cannot be distinguished from the Bolivian ones.‡ *S. obscura* Tacz. becomes, therefore, a strict synonym of *Emberiza obscura* Lafr. & D'Orb.

\* *Fringilla fuliginosa* . . . iitr. *Naturg. Bras.* 3, i. p. 628 (1830.—Camamá, Bahia, East Brazil).

† *Spermophila pauper* Berlepsch & Taczanowski, *P. Z. S.* 1884, p. 293 (Cayandeled, West Ecuador).

‡ Specimens from different localities average as follows:

One ♂ ad., Santa Cruz de la Sierra, Bolivia (Carnegie Museum)	Wing 59;	tail 47;	bill $9\frac{1}{2}$ mm.
One ♀ ad., Omeja, Bolivia (Mus. H. v. Berlepsch)	Wing $53\frac{1}{2}$ ;	tail 44;	bill 9 mm.
Three ♂ ad., Marañon, N.E. Peru (Tarapoto, Viña)	Wing 54-56;	tail 42-44;	bill 8-9 mm.
One ♂ ad., Callacate, N.W. Peru	Wing 56;	tail $44\frac{1}{2}$ ;	bill $9\frac{1}{2}$ mm.
One ♀ ad., Marañon, N.E. Peru (Viña)	Wing 53;	tail 42;	bill $9\frac{1}{2}$ mm.
Four ♂ ad., Chimbo, S.W. Ecuador	Wing $53\frac{1}{2}$ -56;	tail 41-44;	bill $8\frac{1}{2}$ - $9\frac{1}{2}$ mm.
One ♂ ad., Paramba, N.W. Ecuador	Wing 54;	tail $41\frac{1}{2}$	bill 9 mm.

This species is evidently out of place in the genus *Sporophila*, and seems best referred—for the present at least—to *Catamenia*, although its bill, in comparison to *C. analis*, is laterally much more compressed, with the culmen slightly ridged instead of being distinctly rounded. The upper mandible, however, is very nearly as depressed as in *C. analis*.

*C. obscura* (Lafr. & D'Orb.) ranges from N.W. Argentine (Salta) through Eastern Bolivia (Chiquitos, Santa Cruz de la Sierra, Omeja) and Peru (Paltaypampa, Tarapoto, Viña, Huamachuco, Callacate) to Western Ecuador (Chimbo, Cayandeled, Paramba).

#### 54. *Poospiza cabanisi* Bonap.

*Poospiza cabanisi* Bonaparte, *Consp. Av. i. p. 473* (July 1850.—Paraguay, Mus. Paris).

*Poospiza assimilis* Cabanis, *Mus. Heinan. i. p. 137* (May 1851.—South Brazil and Paraguay).

No. 1. Mus. d'Hist. Nat. Paris. Adult (skin). Paraguay, Bonpland coll. "No. 108, Gen. Dub. cancellé en dessous." On the back of the label in Bonaparte's own handwriting: "*Poospiza Cabanisi* Bonap."

Wing 68; tail 66; bill 12 mm.

This specimen, which is undoubtedly the type of Bonaparte's description, belongs to the species commonly called *P. assimilis* Cab., and agrees pretty well with a ♂ ad. from São Lourenço, Rio Grande do Sul, H. von Ihering coll. in the Paris Museum. But being in rather fresher plumage, it is everywhere brighter, the mantle more decidedly brownish, the upper part of the head washed with olive-grey, etc. Above the eye and auricular region there is a broad white superciliary stripe; throat and foreneck are pale greyish buff, middle of breast and abdomen largely white; sides of body and crissum, as also **the whole of the lower rump, including the upper tail-coverts**, bright cinnamon-rufous; only the two outermost pairs of rectrices tipped with white, etc.

Bonaparte's name having priority must supersede the term *assimilis* Cab. Cabanis' statement that *P. cabanisi* is well characterised by **lacking the rufous colour on the rump**. I am unable to understand, for Bonaparte in the original description expressly says: "**uropygio, lateribus crissoque fulvo-castaneis**."

*P. cabanisi* Bonap. ranges from southern São Paulo (Ytararé), through Paraná and Rio Grande do Sul to Paraguay and the Argentine provinces of Misiones and Entrerios.\*

#### 55. *Emberizoides megarhyncha* Bonap. = *Embernagra platensis* (Gm.) juv.

*Emberizoides megarhyncha* Bonaparte, *Consp. Av. i. p. 482* (July 1850.—Mus. Paris, ex Brasil.).

No. 1. Mus. d'Hist. Nat. Paris, juv. (mounted): "*Emberizoides megarhyncha* Bp. *Type*, du Brésil, par M. Auguste Saint-Hilaire, août 1822."

Wing 81, tail 84, bill 17½ mm.

This is quite a young bird, mostly covered with the fluffy feathers of the nestling plumage; only on the shoulders (lesser wing-coverts) and here and there on the back some isolated feathers of the adult dress are just coming out. The large, thickish bill, and the strong legs with long toes, leave no doubt as to its being a pullus of *Embernagra platensis*.

\* I have examined fourteen specimens from the following localities: 2 (♂ ♀) Ytararé, S. Paulo; 4 (2 ♂, 2 ♀) Roça Nova, Serra do Mar, Paraná; 1 ♂ Campo Largo, Paraná; 6 Rio Grande do Sul (Taquara do Mundo Novo, São Lourenço, Arroio Grande); 1 ♂ La Soledad, Entrerios.

The concealed basal portions of the rectrices are pale green, the anal region and under tail-coverts bright buff, as in adult specimens from Barracas al Sud (Buenos Aires), while the newly-grown lesser wing-coverts show exactly the same yellowish green tinge.

In other respects the type fairly agrees with Dr. Sharpe's\* description of the young of *E. platensis*. The top of the head and back are buffy brown, broadly striped with blackish brown; the median and greater wing-coverts dusky, with whitish-brown edges; the outer margins to the remiges duller green than in the adult; the under surface is whitish (instead of olive-grey), with distinct reddish brown shaft-streaks on foreneck, breast, and flanks. Perfectly adult birds of *E. platensis* have no traces of dusky markings underneath, but in immature examples there are sometimes dark brown streaks on the foreneck to be seen.

The upper mandible, in the type specimen, is blackish brown, the cutting-edges yellowish brown, the lower mandible whitish.

*Emberizoides megarhyncha* Bp. is, thus, to be added to the synonyms of *E. platensis*. Dr. Sharpe\* had doubtfully referred the name to *Emberizoides herbicola* (Vieill.).

#### 56. On *Empidochanes poecilocercus* Pelz. and *Knipolegus pusillus* Scl. & Salv.

In the second part of his well-known *Zur Ornithologie Brasiliens* the late August von Pelzel described as a new species *Empidochanes poecilocercus* from a single female example, obtained by the celebrated traveller J. Natterer on the Amajaú, one of the tributaries of the Rio Negro. The species was not mentioned again in ornithological literature until Berlepsch and Hellmayr,† from an examination of the type specimen, declared it to represent a very distinct form not to be confounded with any other member of the genus *Empidochanes*. Two years afterwards I recorded a second example, also a female, from Itaitúba, a small village on the left bank of the Tapajóz River.‡ So far as I know, no other specimens have been obtained since.

In 1873 Messrs. Sclater and Salvin§ published the description of a new Tyrant, *Knipolegus pusillus*. The type, which had been procured by A. R. Wallace somewhere on the Lower Amazons,|| remained unique till 1898, when G. K. Cherrie was fortunate in getting two males at Perico, on the upper Orinoco, Venezuela.¶ In 1907 Miss Snethlage\*\* shot a single male near Alcobaça, on the Tocantins, and in the same year the late W. Hoffmanns sent an adult male from Jamarysinho, a village on the Rio Machados, Madeira district, to the Tring Museum.††

Thus, it will be seen that the two known specimens of *E. poecilocercus* were females, while of *Knipolegus pusillus* only males had been secured. When lately investigating the affinities of Pelzel's species I was struck by its similarity to the females of certain species of *Knipolegus*, both in structure and in style of coloration.

\* *Cat. B. Brit. Mus.* xii. 1888. p. 769.

† *Journ. f. Ornith.* 53. 1905. p. 27.

‡ *Nov. Zool.* xiv. 1907. p. 12.

§ *Nomenclator Avium Neotrop.* p. 158.

|| Owing to loss of the original label the exact locality could not be ascertained.

¶ Berlepsch and Hartert, *Nov. Zool.* ix. 1902. p. 36.

\*\* *Journ. f. Ornith.* 56. 1908. p. 525.

†† Hellmayr, *Nov. Zool.* xvii. 1910. p. 284.

On going deeper into the question, I became convinced that it had no relation whatever to *Empidochanes*, being in every way a typical *Knipolegus*, and I arrived at the final conclusion that *K. pusillus* and *E. poecilocercus* were merely male and female of one and the same species.

Four specimens of the former and two of the latter agree perfectly with each other in proportions, shape of the wing, development of the rictal bristles, etc.

All six examples have the three outer primaries narrowed, incised, and acuminate, as described by Berlepsch and Hellmayr,\* this peculiarity being equally well pronounced in both sexes; the nostrils are small circular openings; there are numerous long, rather soft rictal bristles. In coloration, the female (*E. poecilocercus*) recalls that of *K. cyanirostris* (Vieill.), having the inner web of the rectrices rufous, the upper tail-coverts cinnamon, and the chest flammulated with dusky. The only point in which it differs from the male (*K. pusillus*) is the slightly narrower bill, with more distinctly ridged (less rounded) culmen, and its blackish (instead of plumbeous) colour. The same sexual difference, however, exists in the allied species.

For the sake of convenience I append the measurements of the specimens examined by me, together with the synonymy, range and characters of the species, which has to stand as:

*Knipolegus poecilocercus* (Pelz.).

*Empidochanes poecilocercus* Pelzeln, *Zur Ornith. Bras. ii.* p. 116, 181 (1868.—Rio Amajaú, Rio Negro District, N. Brazil; descr. ♀); Berlepsch & Hellmayr, *Journ. f. Orn.* 53, 1905. p. 27 (crit.); Hellmayr, *Nov. Zool.* xiv. 1907. p. 12 (Itaitúba, R. Tapajéz; 1 ♀).

*Knipolegus unicolor* (nec Kaup) Sclater & Salvin, *P. Z. S.* 1867. p. 577 (one example without exact locality, A. R. Wallace coll.).

*Knipolegus pusillus* Sclater & Salvin, *Nomencl. Av. Neotrop.* p. 158 (1873.—Lower Amazon, A. R. Wallace coll., descr. ♂ ad.); Sclater, *Cat. B. Brit. Mus.* xiv. 1888, p. 47 (♂ ad.); Berlepsch & Hartert, *Nov. Zool.* ix. 1902. p. 36 (Perico, Orinoco R., Venezuela); Sneathlage, *Journ. f. Orn.* 56. 1908. p. 525 (Alcobaça, R. Tocantins; 1 ♂ ad.).

*Knipolegus pusillus* Hellmayr, *Nov. Zool.* xvii. 1910, p. 284 (Jamarysinho, Rio Machados, R. Madeira district; 1 ♂ ad.).

*Hab.* Amazonia, North Brazil: Rio Amajaú, upper R. Negro (Natterer); Itaitúba, R. Tapajóz (Hoffmanns); Jamarysinho, R. Machados (tributary of the Madeira (Hoffmanns)); Alcobaça, R. Tocantins (Sneathlage). Central Venezuela: Perico, upper Orinoco R. (Cherrie).

♂ ad. (Type of *C. pusillus* Scl. & Salv.). Above and below uniform black, glossed with metallic blue, this gloss being much more pronounced on the pileum and back than on the lower parts. Wing-coverts and remiges dull brownish black, the lesser and median wing-coverts with narrow, glossy metallic blue edges; tail deep black. Axillaries and under wing-coverts dull blackish brown. Bill plumbeous, base of lower mandible horny brown. Wing 59—61; tail 50½—52; bill 11½—12½ mm.

♀ ad. (Type of *Empidochanes poecilocercus* Pelz.). Top of the head and back light olivaceous brown; upper tail-coverts, in decided contrast, clear rufescent cinnamon; median and greater wing-coverts dusky, broadly tipped with olivaceous buff, forming two distinct bars across the wing; lesser wing-coverts like the back; remiges dusky, the secondaries exteriorly edged with buff, especially along the apical half; rectrices blackish brown, the middle pair very narrowly bordered with cinnamon

\* *Journ. f. Ornith.* 53, 1905, p. 27.



on either side, the others with the inner half of the inner web cinnamon-rufous, and a slight margin of the same colour along the outer web. Lores and a rim round the eye yellowish buff; cheeks, auricular region and sides of the neck light olivaceous brown like the back. Under surface pale primrose-yellow, throat and under tail-coverts more buffy; sides of throat, foreneck, and sides of body flammulated with pale brown, most strongly on foreneck. Axillaries, under wing-coverts, and an extremely narrow edge along the quill-lining buff. Bill blackish, basal half of lower mandible paler brown. Wing 55—57; tail 48—51; bill 12 mm.

*Obs.* In both sexes the feathers of the pileum are somewhat elongated so as to form a slight, rounded crest. The tail is moderately rounded, the outer rectrices being 2 to 3 mm. shorter than the median ones. The males from the Orinoco (Perico) are practically identical with the type in the British Museum, while that from Jamarysinho (R. Madeira) has the upper parts duller, less bluish black. The female from Itaituba also differs in some particulars from the type of *E. poecilocercus*; the back is duller olive-brown, the auricular patch darker brown, the throat less buffy, the under tail-coverts are more ochraceous, and the dusky stripes on the chest darker as well as more strongly defined. These slight divergencies are most probably individual.

*Material.*

- No. 1. Brit. Museum (♂) ad., Lower Amazons.  
Type of *C. pusillus* Scl. & Salv. . . . . Wing 61; tail 52; bill 11½ mm.
- No. 2. Mus. H. v. Berlepsch, "♂" vix ad.,  
Perico, Orinoco R. Venezuela, September 25, 1898 . . . . . Wing 61; tail 52; bill 12½ mm.
- No. 3. Mus. Tring "♂" ad., Perico, September 25, 1898 . . . . . Wing 59; tail 50½; bill 12 mm.
- No. 4. Mus. Tring "♂" ad., Jamarysinho,  
R. Machados, September 14, 1907 . . . . . Wing 59; tail 51; bill 12 mm.
- No. 5. Mus. Vienna, No. 18324. "♀" ad.,  
Rio Amajaú, N.W. Brazil, September 16, 1831. Type of *E. poecilocercus*, Pelz. . . . . Wing 57; tail 51; bill 12 mm.
- No. 6. Mus. Tring, "♀" ad., Itaituba, R. Tapajóz, N. Brazil, January 12, 1906 . . . . . Wing 55; tail 48; bill 12 mm.

57. *Ochthoeca keaysi* Chapm. = *Caenotriccus simplex* Berl.

*Caenotriccus simplex* Berlepsch, *Journ. f. Ornith.* 49. p. 88 (Jan. 1901.—Sandillani, West Bolivia).

*Ochthoeca keaysi* Chapman, *Bull. Amer. Mus. N.H.* xiv. p. 227 (Sept. 1901.—Inca Mine, Marcapata, South-eastern Peru).

No. 1. Mus. H. v. Berlepsch, No. 1535, G. Garlepp coll. Adult (not sexed), Sandillani, W. Bolivia, 2500 m. alt., July 6, 1896.

Type of *Caenotriccus simplex* Berl. . . . ad. Wing 55; tail 43½; bill 11½ mm.

No. 2. Mus. H. v. B., No. 912, G. Garlepp coll. Adult (not sexed), S. Jacinto, E. Bolivia, January 13, 1891 . . . ad. Wing 53; tail 39; bill 12 mm.

No. 3. Amer. Mus. Nat. Hist., No. 74100. Orig. label: "August 4, 1900, ♀, No. 86, Inca Mine, Peru, H. H. Keays coll."

Type of *Ochthoeca keaysi* Chapm. . . . ♀ imm. Wing 53; tail 43; bill 12 mm.

The type of *O. keaysi* agrees very well with the Bolivian specimens except

that the rump, upper tail-coverts, thigh, and flanks are rather more rufescent brown. The back, too, appears to be slightly more brownish green, while the edges to the wing-coverts and remiges are deeper rufescent brown. These insignificant variations are, no doubt, due to age, for the type of *O. keaysi* is immature. The middle of the breast and abdomen is decidedly yellowish, as in No. 2 (S. Jacinto), whereas in the type of *C. simplex* the belly is nearly uniform dingy olive-green. I agree with Count Berlepsch that this species, notwithstanding its rather divergent bill, finds its natural place in the genus *Caenotriccus*. To *Ochthoeca* it has, as far as I can see, no close relation.

*C. simplex* is only known as an inhabitant of the mountains of Northern Bolivia and South-Eastern Peru (Marcapata).

58. *Ochthoeca olivacea* Allen = *Tyranniscus improbus* Sel. & Salv.

*Tyranniscus improbus* Selater and Salvin, *P. S. Z. Lond.* 1870. p. 841. pl. 53. fig. 3 (1871.—Mérida, Venezuela (type); Ocaña, North Colombia).

*Ochthoeca olivacea* Allen, *Bull. Amer. Mus. N. H.* xiii. p. 152 (1900.—Valparaiso, Santa Marta, North Colombia).

No. 1. Amer. Mus. Nat. Hist., No. 72728. Type of *Ochthoeca olivaceus* (sic) Allen. Orig. label: "Santa Marta Expedition, 1898-99. Valparaiso, Colombia, April 14, 1899, G. H. Hull." Adult: Wing 64\*; tail 56\*; bill 10 mm.

This bird is, no doubt, the same as *T. improbus*, of which the Tring Museum has a large series from the type locality. In fact, on comparing the Santa Marta specimen with fourteen skins from Mérida, I cannot detect the slightest difference either in colour or size: the back is of exactly the same shade of green; the darker crown forms a kind of dusky cap; a distinct frontal band and a spot above the brownish black antecular patch are white, the auriculars dark olive-brown; the whitish superciliary line is inconspicuous, as in an adult male from Valle (January 17, 1888); the throat dull white; the foreneck flammulated with pale yellowish on a light greyish ground, etc. The pale markings on the wing show the same distribution as in Mérida examples, but the edges to the median wing-coverts are perhaps more whitish than in the majority of the latter.

Five adult males from Mérida measure: wing 61-63; tail 52-55; bill 10-11 mm.

*T. improbus* inhabits the mountains of Western Venezuela (Mérida) and Northern Colombia (Santa Marta, Ocaña). In the north coast ranges of Venezuela it is replaced by *T. petersi* Berl. About the characters of this species cfr. Hellmayr and Seilern, *Arch. f. Naturg.* 78, Abt. A, Heft 5, September 1912, p. 79.

59. *Ochthoeca jesupi* Allen, should be *O. diadema jesupi* Allen.

*Ochthoeca jesupi* Allen, *Bull. Amer. Mus. N. H.* xiii. p. 151 (1900.—San Lorenzo, Santa Marta, North Colombia).

No. 1. Amer. Mus. Nat. Hist., No. 72727, ♀ imm., S. Lorenzo, 7000 ft., May 12, 1899, G. H. Hull.

Type of *O. jesupi* Allen. Wing 58; tail 49; bill 11½ mm.

So far as is possible to judge from a single immature specimen, this appears to be a distinct form, most nearly allied to *O. diadema diadema* (Hartl.). It resembles the Bogotá bird in the coloration of the wings, but may be recognised

\* In the original description the measurements, by misprint, are given as follows: wing 54; tail 46 mm.

by lacking the blackish cap (the feathers of the pileum being olive-green like the back, with inconspicuous dusky central spots), by its decidedly lighter, more greenish brown back, somewhat paler yellow frontal band, and by having the flanks slightly washed with brownish. The absence of the dusky cap **may** be due to immaturity, but the other characters, though slight, serve to distinguish *O. d. jesupi* from the **young** of *O. diadema*. The upper wing-coverts are but obsoletely margined with the colour of the back.

*O. diadema gratiosa* differs from the Santa Marta bird by its blackish cap, much darker, rufescent olive back, more greenish breast (without yellowish admixture), and by having the greater wing-coverts broadly tipped with cinnamon rufous.

The three "species" replacing each other geographically are more properly designated by trinomials.

(a) *O. diadema diadema* (Hartl.)\* Andes of Colombia (Bogotá) and Western Venezuela (Mérida).†

Seven adults (not sexed) from Bogotá. Wing 58, 60½, 63-65; tail 50, 54, 57-59; bill 11½-12½ mm.

Four adult males from Escorial, Mérida. Wing 63½-65; tail 55-59; bill 11½-12½ mm.

(b) *O. diadema jesupi* Allen. Sierra Nevada de Santa Marta, N. Colombia.

One female (imm.) from San Lorenzo . Wing 58; tail 49; bill 11½ mm.

(c) *O. diadema gratiosa* (Scl.), ‡ Mountains of Ecuador and N.W. Peru (Tambillo).

Five adult males from Ecuador . . . Wing 63-64; tail 54-56; bill 11-12 mm.

Four adult females from Ecuador. . . Wing 58-61; tail 48-52; bill 11-12 mm.

#### 60. *Pogonotriccus alleni* Oberholser = *P. ophthalmicus* Tacz.

*Pogonotriccus ophthalmicus* Taczanowski, *P. Z. S.* Lond. 1874, p. 135 (1874.—Amable Maria, Central Peru).

*Leptopogon godmani* Sclater, *P. Z. S.* 1887, p. 48 (1887.—Sarayaçu, Ecuador).

*Pogonotriccus alleni* Oberholser, *Proc. U. S. Nat. Mus.* xxv. 1902, p. 65 (1903.—Rio Cauca, Western Colombia).

In the first part of this paper § I have shown *Leptopogon godmani* to be identical with *P. ophthalmicus*, and now I am able to state that *P. alleni* Oberholser is another synonym of the same species. Although this identity has already been mentioned in another connection,|| a more detailed explanation of the case seems desirable. My conclusions are based upon the following specimens:

- No. 1. Munich Museum, ♂ ad. Cumbre de Valencia, Venezuela, October 2, 1910. S. M. Klages coll. . . . . Wing 60; tail 57; bill 9½ mm.
- No. 2. Carnegie Museum, No. 35,126 ♂ ad. Cumbre de Valencia, Venezuela, October 13, 1910. M. A. Carriker coll. . . . . Wing 59; tail 55; bill 10 mm.

\* *Mytobius diadema* Hartlaub, *Rev. Zool.* vi. p. 289 (1843.—"Nouvelle Grenade," i.e. Bogotá).

† Birds from Mérida are practically identical with those from Bogotá.

‡ *Mecocerculus gratiosus* Sclater, *P. Z. S.* 1862, p. 113 (Ecuador).

§ *Nov. Zool.* xiii. 1906, p. 322-3.

|| See Hellmayr and Scilern, *Archiv f. Naturg.* 78, Abt. A, Heft 5, September 1912, p. 77, note 2.

- No. 3. Museum Seilern, (♀) ad., Cumbre de Valencia, October 12, 1910. S. M. Klages coll. . . . . Wing 54; tail 49; bill 9 mm.
- No. 4. Tring Museum, (♂) ad., Primavera, Cauca, West Colombia, 900 m, Raap coll. . . . . Wing 58½; tail 57; bill 10 mm.
- No. 5. Amer. Mus. Nat. Hist., "♂" ad., Rio Cauca, Colombia, June 1898, J. H. Batty coll. No. 71758. Type of *P. alleni* Oberholser . . . . . Wing 57½; tail 53½; bill 10 mm.
- No. 6. Tring Museum, (♂) ad., Bogotá coll. (ex Mantou) . . . . . Wing 62; tail 56; bill 10 mm.
- No. 7. Tring Museum, "♂" ad., West side of Pichincha, Ecuador, November 1898. Goodfellow coll. . . . . Wing 62; tail 55½; bill 10½ mm.
- No. 8. Tring Museum, "♂" imm., West side of Corazón, Ecuador, September 1898. Goodfellow coll. . . . . Wing 60½; tail 50; bill 9½ mm.
- No. 9. Tring Museum, "♂" ad., West side of Corazón, Ecuador, September 1898. Goodfellow coll. . . . . Wing 58½; tail 53; bill 10 mm.
- No. 10. Tring Museum, "♀" ad., West side of Pichincha, Ecuador, November 1898. Goodfellow coll. . . . . Wing 55; tail 50; bill 9½ mm.
- No. 11. Museum Berlepsch, ♂ ad., Huambo, North Peru, March 15, 1880. J. Stolzmann coll. . . . . Wing 62; tail 57; bill 10 mm.
- No. 12. Museum Berlepsch, "♂" ad. Mapoto, East Ecuador, January 15, 1884. J. Stolzmann coll. . . . . Wing 61; tail 55; bill 10 mm.

The small differences noticed by Hellmayr and Seilern\* as existing between Venezuelan skins (Nos. 1—3) and two undoubted *P. ophthalmicus* (Nos. 11, 12) are not borne out by the larger series which came to hand since our remarks were written. It is true, the two examples from the Cauca River, including the type of *P. alleni*, agree with the Cumbre birds in the light cinereous pileum, clear yellowish green back, bright sulphur-yellow colour of the anterior auricular region, and in the lesser extent of the whitish chin-spot, as contrasted to the two specimens in the Berlepsch Collection (Nos. 11, 12); but the series from Ecuador shows considerable variation in all these characters, and the Bogotá skin (which would be expected to belong to the pale northern race) is fully as dark as the Huambo bird (No. 11).

In the adult male from Pichincha (No. 7) and the immature one from Corazón (No. 8) the anterior auricular region is white, scarcely shaded with yellowish, as in the Huambo specimen (No. 11), while in the two others from the same localities (Nos. 9, 10) it is even more deeply olive-yellow than in the Cumbre and Cauca examples. The crown is light cinereous in No. 9 (Corazón), as in the latter, but very dark slate-grey in No. 7 (Pichincha), while the others are intermediate. As to the colour of the back, only one of the Ecuadorian skins (No. 8, Corazón) matches those from Venezuela, but the three others are also decidedly lighter green than

\* *Arch. f. Naturg.* 78, Abt. A. Heft 5, September 1912, p. 77.

the Huambo bird. But again, the adult male from Mapoto and the Bogotá skin are absolutely indistinguishable from the Peruvian skin, having the head very dark slate-grey, the back dull olive green, the anterior ear-coverts whitish, and the breast strongly olivaceous.

From the above, it will be seen that though there is a certain individual variation, the colour differences are not peculiar to any geographic area. Therefore, we can admit only one form, *P. ophthalmicus*, ranging from Central Peru (Amable Maria, Ropaybamba, La Gloria) through Ecuador to Western Colombia (Cauca Valley) and North-western Venezuela (Cumbre de Valencia).

61. *Tyrannus fumigatus* Lafr. & D'Orb. should be *Myiochanes fumigatus fumigatus* (Lafr. & D'Orb.)

*Tyrannus fumigatus* Lafresnaye & D'Orbigny, Syn. Av. i. in *Mag. Zool.* 1837, cl. ii. p. 43, (1837.—Yungas in Bolivia).

*Contopus ardesiacus* (nec Lafresnaye 1844) Sclater & Salvin, *P. Z. S.* 1879, p. 615 (Tilotilo, Yungas, Bolivia); Sclater, *Cat. B. Brit. Mus.* xiv. 1888, p. 237 (part., l, m, Tilotilo, Bolivia).

No. 1. Mus. d'Hist. Nat. Paris. Skin, labelled: "D. 261, Bolivia. No. 175. D'Orbigny, 1834. *Tyrannus fumigatus* Nob."—Wing 93; tail 78½; bill 16 mm. Type of species.

No. 2. Mus. v. Berlepsch, "♀" ad. S. Antonio, Yungas, Bolivia, July 5, 1895, G. Garlepp coll., No. 1163 . . . . . Wing 92; tail 76½; bill 16 mm.

No. 3. Mus. Berlepsch, "♀" ad. S. Antonio, August 7, 1895, No. 1189 . . . . . Wing 90; tail 80; bill 16 mm.

No. 4. Mus. Berlepsch, "♀" ad. S. Antonio, August 31, 1895, No. 1253 . . . . . Wing 90; tail 76; bill 15¾ mm.

No. 5. Mus. Berlepsch, "♀" ad. Songo, western Yungas, Bolivia, June 30, 1896, No. 2347 . . . . . Wing 91; tail 78; bill 16½ mm.

No. 6. Mus. d'Hist. Nat. Paris, adult. Tilotilo, Bolivia. Buckley coll., Boucard collection . . . . . Wing 92; tail 79; bill 16½ mm.

The type of *Tyrannus fumigatus* Lafr. & D'Orb. which has never been identified, proves, on examination, to be an example of the species universally called *Contopus ardesiacus* (Lafr.). There are four specimens from the same country in the Berlepsch Museum, while the French National Collection possesses an unsexed adult bird obtained at Tilotilo, Bolivia, by the late Clarence Buckley. On comparing the six Bolivian skins with a considerable series from North Peru (Tambillo), Western Ecuador, Colombia (Bogotá) and Western Venezuela (Andes of Mérida), I find several well-marked differences which warrant the recognition of a darker, northern form, *Myiochanes fumigatus ardesiacus* (Lafr.). The Bolivian birds are altogether paler and lighter in coloration: the back is clear sooty grey with an olivaceous tinge, the sooty blackish crown forming a rather well-defined dusky cap; the under parts are lighter olivaceous grey, with the throat and middle of the belly decidedly whitish. These characters are strongly pronounced in the fresh plumage (Nos. 1—5); the Tilotilo bird (No. 6)—in very worn, abraded condition—is scarcely lighter above than Bogotá skins in corresponding stage, but the much paler

under-surface serves to distinguish it at a glance. In the northern race \* the back is much darker sooty grey, being little, if anything, lighter than the crown; the whole under surface, from the chin to the anal region, is uniform sooty grey [very nearly as dark as the upper parts], the under tail-coverts only being edged with whitish.

Count Berlepsch † has united *Contopus brachyrhynchus* Cab., ‡ from N.W. Argentine, with *M. f. fumigatus*, as defined above. In fact, when studying the type, forwarded by the authorities of the Berlin Museum, in company with the Count several years ago, I could not perceive any material difference between the Bolivian series and the Tucumán bird. However, it should be noted that the type specimen of *C. brachyrhynchus*, in bleached breeding plumage, is not quite fit for the purpose of comparison. Since that time I have had the opportunity of examining five adults from the mountains of N.W. Argentine, § and they appear to me to represent another recognisable form, characterised by its very pale coloration. The nape, back and sides of the head, instead of being sooty grey, are light smoke-grey tinged with olivaceous, the crown nearly concolour with the mantle; the throat is more whitish; the breast much paler greyish, and the yellowish white area in the middle of the belly far more extended. The wings are apparently somewhat longer (98—101 mm.).

There are, thus, three races to be distinguished :

(a) *Myiochanes fumigatus ardosiacus* (Laf.) the darkest, ranging from Central Peru through Western Ecuador to Colombia, Western Venezuela (Mérida) and British Guiana (Roraima).

(b) *Myiochanes fumigatus fumigatus* (Laf. & D'Orb.), lighter, with whitish admixture on throat and middle of belly, inhabiting the highlands of Bolivia.

(c) *Myiochanes fumigatus brachyrhynchus* (Cab.), the palest, occurring in the high mountains of North-Western Argentine (Tucumán, Jujuy). ¶

The recently described *Myiochanes ardosiacus polioptilus* Todd,\*\* from the Venezuelan coast-mountains—which I have not seen—appears to be a fourth member of this group, and should be called *M. fumigatus polioptilus* Todd.

## 62. *Neopipo helenae* McConnell should be *N. cinnamomea helenae* McConnell.

*Neopipo helenae* McConnell. *Bull. B.O.C.* xxvii. p. 105 (1911.—Ituribisce, Brit. Guiana).

No. 1. Mus. McConnell (♂) ad. Ituribisce, Brit.

Guiana, October 1908, *N. helenae* McCon-

nell. Type . . . . . Wing 51; tail 38; bill 7½ mm.

This specimen and an adult male from French Guiana in the Tring Museum differ from *N. cinnamomea* of Upper Amazonia by having the lores greyish white

\* I have examined specimens from the following localities: 3 Bogotá, 1 Western Colombia, 3 Mérida, 4 Western Ecuador, 1 N.W. Peru (Tambillo), 1 Central Peru (Huánuco), 1 British Guiana (Roraima).

† *Ornis*, xiv. February 1907, p. 478.

‡ *Journ. f. Ornith.* 31, p. 214 (1883.—Tucumán).

§ Two ♂♂ from Tucumán; 1 ♂, ♀♀ from Ledesma, Jujuy.

¶ *Tyrannula ardosiacae* Lafresnaye, *Rev. Zool.* vii. p. 80 (1844.—"Colombie," sc. Bogotá).

\*\* See also Lillo, *Apunt. de His. Nat.* i. No. 3, 1909, p. 42 (Tucumán); Hartert and Venturi, *Nöb. Zool.* xvi. 1909, p. 203 (Tucumán, Jujuy); Dabbene, *Ornith. Argent.* i. 1910, p. 347 (Tucumán).

\*\* *Ann. Carnegie Mus.* viii. No. 2, p. 208 (1912.—Lagunita de Aroa, Est. Lara, North Venezuela).

and the cheeks, ear-coverts and sides of neck dingy olive-grey (instead of deep buff). Furthermore, the interscapular region is darker, dull rufescent brown, with a greyish tinge (instead of bright tawny brown).

I am unable to discover any other constant differences. Though the type has rather light ochreous under parts, passing into buffy whitish (not "greyish white," as said in the original description) on the throat, the Cayenne bird does not differ in this respect from Upper Amazonian examples.

The two races are, however, closely allied, and represent each other geographically, so that their natural relationship seems more correctly expressed by trinomial. I herewith give the synonymy, together with a short résumé of their range and characters.

(a) *Neopipo cinnamomea cinnamomea* (Lawr.).

*Pipra* (?) *cinnamomea* Lawrence, *Proc. Acad. Nat. Sci. Philad.* 1868. p. 429 (1868.—"Upper Amazon").

*Neopipo rubicunda* Sclater & Salvin, *P. Z. S. Lond.* 1869. p. 438. tab. 30. fig. 3. (1869.—Chamicuros, Eastern Peru).

*Neopipo cinnamomea* Sclater & Salvin, *P. Z. S.* 1873. p. 283 (Xeberos, Chamicuros, Eastern Peru); Sclater, *Cat. B. Brit. Mus.* xiv. p. 303 (part. a-c, Chamicuros; d, e, Sarayaçu, East Ecuador); Hellmayr, *Nov. Zool.* xiv. 1907. p. 361 (Humaytha, R. Madeira, Brazil); idem, *l.c.* xvii. 1910 p. 308 (the same).

*Hab.* Upper Amazonia, ranging from the head-waters of the Rio Napo (Sarayaçu), in Ecuador, south through Eastern Peru (Xeberos, Chamicuros) to the Carabaya district (Yahuar-mayo) in South-eastern Peru, and east to the left bank of the Rio Madeira (Humaytha), Western Brazil.

*Characters.* Upper back (interscapulium) bright tawny brown, without greyish admixture; lores buff; cheeks, malar region and auriculars somewhat deeper buff, along the upper edge of the ear-coverts an extremely narrow streak of olive; sides of the neck olivaceous.

*Examined.* Three adults (including the type of *N. rubicunda*) from Chamicuros, one from Sarayaçu, East Ecuador, in the British Museum; one ♂ ad. Humaytha, Rio Madeira, in the Tring Museum; and one ♂ ad. from Yahuar-mayo, Carabaya, S.E. Peru, H. & C. Watkins' coll., in the Munich Museum.

*Obs.* The bird from Humaytha agrees in coloration with that from Yahuar-mayo, but is decidedly smaller and has a slightly shorter bill.

♂ ad. Yahuar-mayo, S.E. Peru . . . . . Wing 54; tail 39; bill  $7\frac{1}{2}$  mm.

♂ ad. Humaytha, W. Brazil . . . . . Wing 49; tail  $35\frac{1}{2}$ ; bill 7 mm.

(b) *Neopipo cinnamomea helenae* McConnell.

*Neopipo helenae* McConnell, *Bull. B. O. C.* xxvii. p. 105 (1911.—Ituribisce, British Guiana).

*N. cinnamomea* (nec Lawrence), Salvin, *Ibis* 1885. p. 301 (Camacusa, Brit. Guiana); Sclater, *Cat. B. Brit. Mus.* xiv. p. 303 (part. f, g, Camacusa); Berlepsch, *Nov. Zool.* xv. 1908, p. 138 (Ipousin, Rio Approuague, French Cayenne).

*Hab.* British Guiana: Camacusa, Ituribisce; French Guiana: Ipousin, Rio Approuague.

*Characters.* Upper back (interscapulium) dull rufescent brown, slightly tinged with greyish; lores greyish white; cheeks, malar region and auriculars (with the exception of small, half-concealed buffy spot on the lower portion) as well as sides of neck dingy olive-grey.

*Examined.* One adult from Ituribisce (type of *N. helenaë*), collection of F. V. McConnell; one ♂ ad. from Ipousin, French Guiana, in the Tring Museum.

♂ ad. Ituribisce, British Guiana (type of subspecies)

Wing 51; tail 38; bill  $7\frac{1}{2}$  mm.

♂ ad. Ipousin, French Guiana . . . . . Wing  $50\frac{1}{2}$ ; tail 36; bill [damaged] mm.

63. *Conopophaga browni* Bangs = *Grallaricula ferrugineipectus* (Scl.).

*Grallaricula ferrugineipectus* Sclater, *P. Z. S. Lond.* xxv. p. 129 (October 1857.—“in Venezuela, in vicin. urbis Caraccas (Levraud); type in Paris Museum).

*Conopophaga browni* Bangs, *Proc. Biol. Soc. Wash.* xiii. p. 100 (1899.—Pueblo Viejo and Chirua, Sierra Nevada de Santa Marta, North Colombia).

No. 1. Muséum d'Hist. Nat. Paris: “Cat. gén.

No. 449, de Caraccas, par M. Levraud, 1856,

No. 137. *G. ferrugineipectus* Scl. type . . . . . Wing 67; tail 30; tars. 21; bill  $13\frac{1}{2}$  mm.

No. 2. Tring Museum: No. 265, A. Mocquerys

coll., adult (not sexed), Ejido [near Mérida],

Venezuela, March 1894 . . . . . Wing 64; tail  $30\frac{1}{2}$ ; tars. 23; bill 14 mm.

No. 3. Collection of E. A. & O. Bangs, No. 6178,

♂ ad., *Conopophaga browni*, Colombia (Chirua),

February 12, 1899 . . . . . Wing 63; tail 31; tars. 22; bill  $13\frac{1}{2}$  mm.

No. 4. Collection of E. A. & O. Bangs, No. 6180,

♀ ad., *C. browni*, Colombia (Chirua), February

12, 1899 . . . . . Wing 63; tail 30; tars. 22; bill 14 mm.

The two specimens from Santa Marta (Nos. 3 and 4) are practically identical with the type in the Paris Museum. The latter has the ochreous frontal band and the sides of the face slightly paler—differences no doubt due to fading, for it has been exposed to the light in the galleries for many years. The Ejido bird, a fresh skin in good condition, agrees in every particular with the Colombian specimens. *C. browni* becomes, therefore, a synonym of *G. ferrugineipectus*.

This scarce species inhabits the mountains of North-western Venezuela (Silla de Caraccas, Ejido) and Northern Colombia (Sierra de Santa Marta), occurring exclusively at high elevations.\*

64. *Agyrtria alleni* Elliot = *Chrysuronia oenone josephinae*

(Bourc. & Muls.) ♀ ad.

[*Ornismya oenone* Lesson, *Hist. Nat. Colibris*, Suppl. Ois-Mouch. p. 157. tab. 30 (1831-32.—“la Trinité,” errore †.)]

*Trochilus Josephinae* Bourcier & Mulsant, *Rev. Zool.* xi. p. 272 (1848.—loc. ign.).

*Agyrtria alleni* Elliot, *Auk* v. p. 263 (1888.—Yungas, Bolivia).

\* The locality “San Esteban, Venezuela” (*i.e.* hot, low country), attached to an example in the British Museum is most certainly incorrect. The species might occur on the higher slopes of the Cumbre de Valencia, although it should be noted that it has not been met with by Mr. S. M. Klages during his recent collecting trip.

† See Hellmayr & Seilern, *Arch. f. Naturg.* 78, Abt. A., Heft 5, Sept. 1912, p. 139.



No. 1. American Mus. Nat. Hist. No. 30,784. *Agyrtria alleni* Elliot. Type, Bolivia, Yungas. Rusby Collection; Collector's label: "Yungas, Bolivia, S. 18°, 6000 ft., Rusby, 1885, June" . . . . . Wing 48; tail 27½; bill 18½ mm.

Nos. 2-5. Mus. H. von Berlepsch. ♀♀ ad. Bolivia (Yungas), G. and O. Garlepp coll. . . . . Wing 49-51; tail 27-29; bill 18½-19 mm.

*Agyrtria alleni*, a species not identified by Salvin and Hartert, proves to have been based upon a female of *C. oenone josephinae*, a well-known Bolivian Humming-bird. The type specimen is practically identical with a female from Songo, western Yungas, in the Berlepsch Collection.\* They agree in the dull bluish green tint of the forehead and crown, and in the reddish bronze tail, the three outer pairs of rectrices having, in both specimens, a distinct, pale greyish apical spot. Like the Songo example, the type has the throat and malar region spotted with glittering golden-green on a white ground, these spots being absent on the chin and but barely indicated along the median portion of the upper throat; the foreneck is white, with bronze-green (not glittering) apical edges; the remainder of the under parts dull white, washed with metallic green on the flanks; under tail-coverts pale greyish, edged with whitish, upper tail-coverts fiery reddish bronze, much the same as in the Songo bird. The bill, in Nos. 1-5, is quite alike both in shape and colour, the maxilla being black, the mandible pale brownish with dusky tip.

Count Berlepsch, who has seen the type, entirely concurs with my identification. *Agyrtria alleni* is consequently to be placed among the synonyms of *C. o. josephinae*, whose range appears to be restricted to the forests of Bolivia.

#### 65. On the group of *Saucerottia sophiae* (Bourc. & Muls.).

The latest reviewer, Mr. Ridgway,† distinguished four races of this group, calling them: *Saucerottia sophiae sophiae* (Costa Rica and Nicaragua), *S. sophiae saucerottei* (Western Colombia), *S. sophiae warscewiczii* (Northern Colombia), and *S. sophiae braccata* (Andes of Venezuela). The specific names are applied in the same sense as by Dr. Hartert,‡ who, however, separated *S. sophiae*, *S. saucerottei* and *S. warscewiczii* specifically, regarding *S. braccata* as a subspecies of the last-named form. To my mind the arrangement put forward by Ridgway is the most correct expression of the natural affinities of these birds, which agree in structure as well as in general style of coloration, and present only slight (though perfectly constant) differences in the colour of the upper and under tail-coverts.

*Trochilus Sophiae* Bourcier et Mulsant,§ though originally based upon Bogotá skins, has generally been referred to the Costa Rica form with coppery or purplish bronze rump and mainly steel-blue under tail-coverts. This misapplication of the name is evidently due to the fact that the alleged type, in the Elliot collection (now the property of the American Museum of Natural History), marked "Nicaragua" belongs to the Central American race. However, on consulting

\* No. 2238, Otto Garlepp coll.

† *Bull. U.S. Mus.* No. 50, v., Nov. 1911, pp. 436-7.

‡ Tierreich, *Lief.* 99, 1900, pp. 52-3.

§ *Annal. Sci. Phys. et Nat., d'Agric. etc., Lyon* vi. p. 318 ("1846."—Bogotá; descr. ♂ ♀).

|| See Ridgway, *Bull. U.S. Mus.* No. 50, v, p. 440, note b.

the original description it is easily seen that this example cannot be the true type of *T. sophiae*. Bourcier and Mulsant characterise their species as follows: "Dessus du corps revêtu de plumes soyeuses, d'un vert moins foncé et plus luisant sur la nuque, les couvertures alaires et la moitié antérieure du dos, passant au **vert cuivreux sur le croupion et la couverture caudale**, dont les dernières plumes sont d'un bleu d'acier . . . **Couverture sous-caudale**, formée de plumes d'un **vert bronzé**, ou d'un **gris bronzé**, étroitement bordé de blanc." This entirely disagrees with the Costa Rica form, in which the **uropygium** and **upper tail-coverts** are strongly glossed with **coppery** or **purplish**, while the **lower tail-coverts** are decidedly **steel-blue** with greyish edges. On the other hand, the above terms apply perfectly well to *S. saucerrottei*, of Western Colombia, which is also found in Bogotá collections.\* This species (of which the Munich Museum possesses a couple from Cali, the type locality) **has the rump and upper tail-coverts bronzy green**, the longest feathers only dull steel bluish with coppery margins, and the **under tail-coverts dusky brown**, edged with whitish.

Moreover, there is in the Paris Museum a nearly adult specimen † from Colombia (id est **Bogotá**), named and presented by Bourcier himself, which corresponds exactly to the description of *T. sophiae* and, besides, agrees in every respect with typical *S. saucerrottei* from Cali! Hence, there seems little doubt that *T. sophiae* is the same as *S. saucerrottei*, while the bird found in Costa Rica and Nicaragua ought to be called *S. hoffmanni* (Cab. & Heine)‡ Those who might object that so excellent an expert as Bourcier would not have described the same species under two different names I would remind of the case of *Lafresnaya saül* (Del. & Bourc.). This species was first made known by Delattre and Bourcier§ under the name *Trochilus saül*, but in another paper published nearly simultaneously it was redescribed as *T. gayi* by Bourcier and Mulsant!||

Mr. Ridgway (l.c.) accepts *S. sophiae* as the oldest specific title for the group. It appears, however, that the article in the *Revue Zoologique* containing the account of *Trochilus saucerrottei* Del. & Bourc.,¶ has a slight priority, as may be inferred from a note in the same periodical (on page 314) concerning the memoir in the *Annales des Sciences phys. et nat. etc. de Lyon*\*\*

Therefore, the nomenclature of the various forms has to stand as follows :

(a) *Saucerottia saucerrottei saucerrottei* (Del. & Bourc.).

*Trochilus Saucerrottei* (err. typogr.) Delattre & Bourcier, *Rev. Zool.* ix. p. 311 (Sept. 1846.—"Caly, Nouvelle Grenade").

*Trochilus Sophiae* Bourcier & Mulsant, *Ann. Sci. phys. et nat., d'Agric. etc. Lyon* ix. p. 318 (1846.—Bogotá).

*Saucerottia sophiae saucerrottei* (sic) Ridgway, *Bull. U.S. Mus.* No. 50, v, 1911. p. 436.

*Hab.* Western parts of Colombia (Cauca, Cali, etc.), also in Bogotá collections.

\* Mons. Simon has an absolutely typical Bogotá skin.

† "No. 852, *Amazilia sophiae* (Bourc. & Muls.). Don de M. Bourcier, Colombie."

‡ *Hemithylaca Hoffmanni* Cabanis & Heine, *Mus. Heinan.* iii. p. 38 (March 1860.—Costa Rica).

§ *Trochilus Saül* Delattre & Bourcier, *Rev. Zool.* ix. p. 309 (Sept. 1846.—Quito, Ecuador).

|| *Trochilus Gayi* Bourcier & Mulsant, *Ann. Sci. phys. et nat., d'Agric., etc., Lyon* ix. p. 325 (1846.—loc. ign.)

¶ *Rev. Zool.* ix. p. 311 (Sept. 1846.—Caly, "Nouvelle Grenade").

\*\* "Tel est le titre d'un travail que cet ornithologiste [viz. Bourcier] va insérer dans les *Annales de la Soc. Roy. d'Agriculture* . . ."

(b) *Saucerotia saucerotiei hoffmanni* (Cab. & Heine).

*Hemithylaca Hoffmanni* Cabanis & Heine, *Mus. Hein.* iii. p. 38 (1860.—Costa Rica).

*Saucerottea sophiae* Hartert, *Tierreich, Lief.* 9, 1900, p. 53 (monogr.).

*Saucerotia sophiae sophiae* Ridgway, *Bull. U.S. Mus.* No. 50, v, 1911. p. 439 (monogr.).

*Hab.* Nicaragua and Costa Rica.

(c) *Saucerotia saucerotiei warscewiczii* (Cab. & Heine).

*Hab.* Northern Colombia (Santa Marta District, Rio Magdalena, Santander, etc.).

(d) *Saucerotia saucerotiei braccata* (Heine).

*Hab.* Andes of Western Venezuela (Mérida).

N.B. *Trochilus caligatus* Gould\* is certainly **not** the Central American form, but may be an earlier name for *S. s. warscewiczii*. The description fits the Santa Marta bird exceedingly well. Cfr. "upper tail-coverts and tail bright steel-blue, under tail-coverts the same, fringed with white." The type (if still extant) should be re-examined.

66. *Amazilia forreri* Bouc. = *Amizilis amazilia* (Less.).

*Orthorhynchus Amazilia* Lesson, *Voyage de la Coquille, Zool.* i. 2. p. 683. pl. 31. fig. 3 (April 1830—"commune dans les buissons du littoral du Pérou").

*Amazilia forreri* Boucard, *The Humming Bird*, iii. p. 7 (March 1893.—"Mazatlan, Mexico." errore!); idem, *Genera of Humming Birds*, 1894, p. 193.

No. 1. *Mus. d'Hist. Nat. Paris, Coll. Boucard.* Adult: "*Amazilia forreri* Boucard, Mazatlan, Mexique, Forrer. *Type of species.*"—Wing 59; tail 35; bill 19½ mm.

Mr. Ridgway † states: "I have not seen this species, which seems to be very distinct." In company with Mons. Simon, I have carefully compared the type with a good series of the West Peruvian *A. amazilia*, and have not the slightest hesitation in saying that it is merely a specimen of that species with wrong locality. It agrees in all essential points with examples from the West Coast of Peru in the Paris Museum and in Mons. Simon's collection, and differs only by its slightly more coppery green upper parts and by having the tips to the median rectrices a shade darker, more blackish green. One example from Peru, however, approaches it very closely. The maxilla is wholly black, as in a Lima specimen in Coll. Simon; the coloration of the under parts is exactly the same as in *A. amazilia*—the throat and foreneck being golden green, the middle of the breast and abdomen white, the flanks pale rufous, etc. Contrary to Dr. Hartert's statement, ‡ the type does not differ in size from ordinary Peruvian specimens.

It is well to remember that the type was **bought** by the late Adolphe Boucard in San Francisco from a dealer who told him it had been obtained by Forrer at Mazatlan. But the "make" of the specimen is very different from that of authentic Forrerian skins, and as no collector has ever met with the species about Mazatlan, we may fairly assume that the assigned locality was an error. *A. forreri* is, therefore, to be excluded from the Mexican Ornis and enters into the synonymy of *Amizilis amazilia* (Less.).

\* *P. Z. S. Lond.* xvi. p. 14 (1848.—New Granada).

† *Bull. U.S. Mus.*, No. 50, v, Nov. 1911, p. 416.

‡ *Tierreich, Lief.* 9, 1900, p. 63.

67. *Amizilis ellioti* (Berl.) replaces *A. verticalis* auct.

Both Dr. Hartert\* and Mr. Ridgway † applied the name *Trochilus verticalis* Lichtenstein ‡ to a species with (immaculate) white under tail-coverts found in the western and central states of Mexico (Sonora, Sinaloa, Jalisco, Michoacán, etc.). In Eastern Mexico (states of Vera Cruz, Oaxaca, and Chiapas) occurs the nearly allied *A. cyanocephala cyanocephala* (Less.), chiefly characterised by having the under tail-coverts olive-grey, faintly glossed with bronze and margined with white.

*Trochilus verticalis* was founded upon specimens obtained by the Prussian travellers Deppe and Schiede in the late twenties of last century. Thanks to the courtesy of Drs. Reichenow and Lorenz, I have been enabled to examine three examples, belonging to the Berlin and Vienna Museums respectively, all marked by Lichtenstein himself as "*Trochilus verticalis*." They were collected by Deppe at Perote, a place situated between **Puebla** and **Jalapa**, in the state of **Vera Cruz**, Eastern Mexico. These skins are unquestionably identical with the bird known as *A. cyanocephala*, having the **sides of the neck metallic green**, and the **under tail-coverts pale brownish olive**, edged with white, and agree in every respect with a series from Jalapa and Oaxaca.

*T. verticalis* is, therefore, to be relegated to the synonymy of *Amizilis c. cyanocephala*, while the **West Mexican** species has to bear the name *Amizilis ellioti* (Berlepsch).

68. *Coccyzus euleri* Cab.

*Coccyzus Euleri* Cabanis, *Journ. f. Ornith.* 21, p. 72 (1873.—Cantagallo, prov. of Rio de Janeiro, South-eastern Brazil).

*Coccyzus euleri* Chapman (& Riker), *Auk*, viii, 1891, p. 159 (crit.; Santarem, Lower Amazons; Chapada, Mattogrosso); Stone, *Ibis*, 1899, p. 476-7 (Aunai, § interior of British Guiana).

*Coccyvus Bairdi* (nec Selater) Pelzeln, *Zur Orn. Bras.* iii, 1869, p. 273 (Paciencia, northern S. Paulo, South Brazil).

*Coccyvus lindeni* Allen, *Bull. Essex Inst.* viii, p. 81 (1876.—Santarem, Lower Amazons).

*Coccyvus americanus* (nec Linnaeus) Allen, *Bull. Amer. Mus. N.H.* v, 1893, p. 136 (Chapada, Mattogrosso; one ♂, October 28, 1883).

No. 1. Vienna Museum: "♂" ad.,  
Paciencia, March 25, 1823.

Natterer coll. No. 1141 (76b) . . . Wing 127; tail 124; tars. 21; bill 24½ mm.

No. 2. Tring Museum: "♂" ad.,  
Pararah, Surinam, August 28,

1905. Chunkoo coll. . . . . Wing 131; tail 129; tars. 22½; bill 27 mm.

*C. euleri* is certainly the rarest among South American Cuckoos. The type was obtained by Euler at Cantagallo, in the province of Rio de Janeiro, and is preserved in the Berlin Museum. Mr. Stone recorded a specimen from the interior of British Guiana that had been forwarded to the Academy of Natural Sciences of Philadelphia. In the British Museum there is a second example from the same country, taken by H. Whitely at Aunai on June 24, 1889. H. H. Smith secured a single male near Chapada, Mattogrosso, S.W. Brazil, on October 28, 1883, which is

\* Tierreich, *Licz.* 9, 1900, p. 62.

† *Bull. U.S. Mus.* No. 50, v, Nov. 1911, p. 422.

‡ *Preisverzeichnis Mexik. Vögel*, 1830, p. 1 (Mexico).

§ Misspelt "Aruwai."

in the American Museum of Natural History in New York. This is the specimen referred to by Allen and Chapman. According to the latter author, the type of *C. lindeni*, collected by Linden at Santarem, on the mouth of the Tapajóz, and forming part of the Museum of Comparative Zoology at Cambridge (Mass.), belongs also to the same species.\* To these are now to be added the two examples given at the head of this article, making a total of seven records.

The specimen of Natterer's (who, as in so many other cases, was the real discoverer of the species) answers well to the original description. *C. euleri* is, in fact, only a diminutive form of the North American *C. americanus* (Linn.), but has no rufous whatever on the wings, and nearly pure white (instead of buff) axillaries and under wing-coverts. The colour of the bill is exactly the same: maxilla black, basal half of maxillary tomium and the mandible orange-yellow, extreme tip of the latter blackish. The upper parts are pale greyish brown, glossed with bronze (like *C. americanus*); the anterior portion of the pileum, lores, and an obsolete stripe above the eye cinereous; auricular region pale brown, darkening anteriorly; wing-coverts pale bronze-brown, like the back; remiges dusky, outer webs light brown, with bronzy sheen; three outer pairs of rectrices black, with long white tips, the two succeeding ones light bronze-brown, passing into blackish terminally and ending in a narrow white margin, the median pair wholly bronze-brown; under surface white, foreneck and sides of breast faintly washed with greyish; inner web of quills broadly edged with pale buff at basal portion.

The Surinam bird is rather larger, with longer bill, and the buff quill-lining is less conspicuous. These trifling variations are most probably individual.

*C. euleri*, notwithstanding its rarity in collections, appears to be rather widely distributed in South America, ranging from the Guianas to Southern Brazil (São Paulo). Nothing is known about its life-history, but it is doubtless a resident and not a migrant from some northern country.

#### 69. *Geococcyx velox* (A. Wagner) replaces *G. affinis* Hartl.

*Cuculus velox* A. Wagner, *Münshener Gelehrte Anzeigen*, iii. p. 95 (July 1836.—Mexico; Karwinski coll.).

*Geococcyx affinis* Hartlaub, *Rev. Zool.* vii. p. 215 (1844.—Guatemala).

No. 1. Zoological Museum, Munich: ad.,

Mexico—Karwinski coll. Type of

*Cuculus velox* A. Wagner . . . Wing 142; tail 280; bill 40 mm.

No. 2. Mus. H. v. Berlepsch: ad., Guatemala, Rockstroh coll. 1891, No.

28,889 . . . . . Wing 137; tail [incomplete]; bill 35 mm.

*Cuculus velox* was described by Dr. Andreas Wagner, then Curator of the Zoological Collections at Munich, from an example obtained by Karwinski somewhere near the city of Mexico (exact locality not stated). Shelley † put it down as a synonym of *G. "mexicanus"* = *G. californianus* (Less.), but examination of the type specimen proves this view to be erroneous. The type, an adult bird in rather worn

\* Dr. Allen says that the "strongly cinereous colour of the lower parts" is a conspicuous feature in *C. lindeni*. This does not well agree with the specimens examined by me, in which the under surface is nearly pure white.

† *Cat. Birds Brit. Mus.* xix. 1891. p. 419.

plumage, agrees in all essential particulars with *G. affinis*, of which Count Berlepsch most obligingly sent me a skin collected by Rockstroh in Guatemala. The under parts are uniform buff, paling into whitish on chin and upper throat; **the lower tail-coverts blackish brown with lighter brown tips** (not buff as in *G. californianus*); **the sides of the foreneck and chest only** are marked with broad, black shaft-stripes. Above, the crown and nape are black, with white apical spots; **the back**, instead of being pale bronze greenish, as in *G. californianus*, is **bright rufescent-brown**; also the upper wing-coverts and inner secondaries (tertials) are metallic brown with coppery reflections, not greenish bronze.

The naked space behind the eye, supposed to be lacking in the type specimen, is developed to the same degree as in other examples, but the taxidermist (who probably took it for a deficiency) had very cleverly covered it with small feathers—which, however, can be easily removed.

There is, of course, the possibility that larger series may show the Guatemalan birds to be subspecifically separable from the typical Mexican form. The point I wish to emphasize is that *Cuculus velox* belongs to the group of *Geococcyx affinis*, and has no relation whatever to *G. californianus* (Less.).

#### 70. *Ramphastos citreopygus* Gould is an artefact!

*Ramphastos citreopygus* Gould, *Monogr. Ramph.* (1st ed.) pl. iv (1834.—“believed . . . from Peru”; Coll. Swainson).

No. 1. University Museum, Cambridge (England), labelled: “E. Mus. Acad. Cantabrigiæ—Swainson Collection, *Type of R. citreopygus* Gould, *Monogr.* ed. 1.” Wing 215; tail 136; bill 156 mm.

*R. citreopygus* has been completely lost sight of ever since it was described by Gould in 1834, being not even mentioned either in the second edition of Gould’s *Monograph* or in the *Catalogue of Birds*. The type specimen, kindly forwarded to me for inspection by Dr. Gadow, turns out to be an artefact: the body is taken from *R. vitellinus* Licht., to which is very cleverly attached the head of *R. monilis* P. L. S. Müll. (= *erythrorhynchus* Gm.). It is only fair to state that Dr. Gadow had already arrived at the same conclusion.

The bill of the substituted head-portion agrees in colour and shape with *R. vitellinus*, of which a large series from the Guianas and Trinidad has been examined, while the body does not present any difference from the well-known *R. monilis*.

Consequently *R. citreopygus* is to be eliminated from the list of existing species.

#### 71. *Aulacorhynchus*\* *wagleri* (Sturm)—a nomenclatorial Note.

In 1835 J. Gould described and figured a Mexican species of Toucan from a single example in the Munich Museum under the name *Pteroglossus paxoninus*. † The same specimen was made the type of a new species, *Pteroglossus wagleri* ‡ by Sturm, six years afterwards. The purpose of this note is to show that the correct specific name of the species in question is that given by Sturm.

\* This term was generally supplanted by the later *Aulacorhamphus* Gray on the insufficient ground of having been previously employed in botany.

† *Monogr. Ramph.*, Part iii, 1835.

‡ *Monogr. Rhamphastiden*, 2. Heft, 1841, tab. [6].

The first author to use the adjective *pavoninus* in combination with *Pteroglossus* was apparently Wagler,\* but his excellent description—taken from a single bird from Valle Real, Mexico, in the Berlin Museum—leaves no doubt as to its being referable to *Aulacorhynchus prasinus* anct. In fact, Gould, four years later, founded his *Pteroglossus prasinus* (Lichtenstein MS.) † on the very same specimen in the Berlin Collection!

However, in spite of its undoubted priority, *pavoninus* (1829) cannot replace *prasinus* (1833), for Wagler evidently had no intention of creating a new name of his own, but merely employed Gmelin's old term. ‡

*Ramphastos pavoninus* Gmelin § is described as "R. viridis, **pennis rubris** et **pavoninis** hinc inde **interspersis**," and refers, no doubt, to some artefact. Consequently, this name should be altogether disregarded. The nomenclature of the two green Mexican Toucans stands, therefore, as follows:

(a) *Aulacorhynchus prasinus prasinus* (Gould).

*Pteroglossus pavoninus* (nec Gmelin) Wagler, *Isis*, 1829, p. 507 (Mexico, Valle Real: specimen in Museo Berolin. decembri occisus).

*Pteroglossus prasinus* (ex Lichtenstein MS.) Gould, *Monogr. Ramph.* (1st edit.), part i, plate (1833.—spec. unicum in Mus. Berolin.).

(b) *Aulacorhynchus prasinus wagleri* (Sturm).

*Pteroglossus pavoninus* (nec Wagler) Gould, *Monogr. Ramph.* (1st edit.), part iii, plate (1835.—specimen in Mus. Monacense); idem, *P.Z.S.* 1835, p. 158 (Mus. Munich).

*Pteroglossus wagleri* Sturm, *Monogr. Rhamph.* Heft 2, tab. [6] (1841.—Mexico: Mus Monac.).

*Aulacorhamphus wagleri* Schater, *P.Z.S.* 1859, p. 388 (Xacatepec, Oaxaca, S.W. Mexico); idem, *Cat. B. Brit. Mus.* xix. 1891, p. 157.

*Aulacorhamphus pavoninus* (errore) Salvin & Godman, *Ibis*, 1830, p. 240 (Amula, Sierra Madre del Sul, Guerrero, Western Mexico).

This western form differs from *A. p. prasinus* in its dull yellowish frontal band and oily-green crown; by lacking the narrow, pale bluish green superciliary streak; and by having the black patch at the base of the culmen confluent with the black stripe along the maxillary tomium. Besides the type, the Zoological Museum at Munich possesses a second adult specimen, both without any further indication than "Mexico." The wing measures 128-129, the tail 125-127, the bill 75-77½ mm.

*A. p. wagleri* appears to be very rare in collections. The late A. Boucard obtained an example at Xacatepec in Oaxaca, Mrs. H. H. Smith another in the Sierra Madre del Sul, state of Guerrero. Additional specimens doubtless exist in American museums.

The following species are discussed in Part II. of this paper:

<i>T. coraya</i> and its races . . . . .	p. 227
<i>T. ridgwayi</i> Berl.	
<i>T. coraya berlepschi</i> Brab. & Chubb	} = <i>Thryothorus coraya griseigula</i> (Lawr.) . p. 229
<i>T. oyapocensis ituribisciensis</i> Brab. & Chubb	

\* *Isis*, 1829, p. 507.

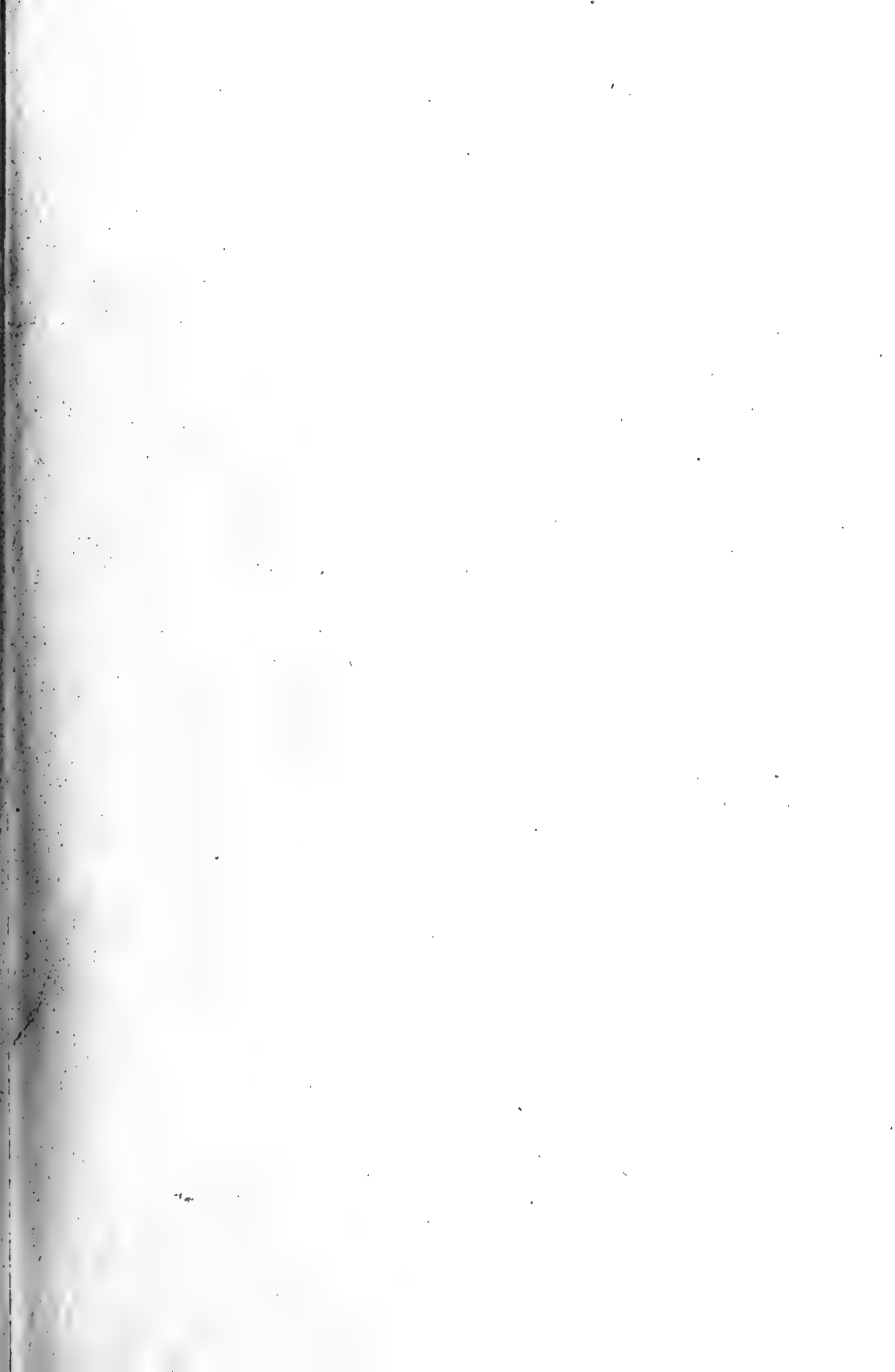
† *Monogr. Ramph.* (1st ed.), Part i. 1833.

‡ See Wagler's remark: "*Ramphastos pavoninus* auctor."

§ *Syst. Nat.* 1, i. p. 353 (1788—ex "Le Toucan vert du Mexique," Brisson, *Orn.* iv. p. 423: ex "Xochitenacatl," Fernandez, *Hist. nov. Hisp.* p. 51, tab. clxxxvii.).

<i>Cyclarhis atrirostris</i> Scl.	= <i>C. nigrirostris</i> Lafr., juv. . . . .	p. 234
<i>Hylophilus brunneus</i> Allen	= <i>Myrmotherula schisticolor sanctae-martae</i> Allen, ♀ . . . . .	p. 235
<i>Chlorospingus canipileus</i> Chapm.	= <i>Basileuterus griseiceps</i> Scl. & Salv. . . . .	p. 235
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<i>Emberiza obscura</i> Lafr. & D'Orb.	= <i>Catamenia obscura</i> (Lafr. & D'Orb.) . . . . .	p. 237
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<i>Ochthoeca jesupi</i> Allen	= <i>Ochthoeca diadema jesupi</i> Allen . . . . .	p. 242
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<i>Geococcyx affinis</i> Hartl.	= <i>Geococcyx velox</i> (Wagner) . . . . .	p. 253
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**A REVISION OF THE LEPIDOPTEROUS FAMILY**

**SPHINGIDAE**

BY THE

**Hon. WALTER ROTHSCHILD, Ph.D.**

AND

**KARL JORDAN, M.A.L., Ph.D.**

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DR. ERNST HARTERT, AND DR. K. JORDAN.

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# NOVITATES ZOOLOGICAE.

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## THE ORIENTAL *ANTHRIBIDAE* OF THE VAN DE POLL COLLECTION.

By K. JORDAN, Ph.D.

THE family of *Anthribidae* of the van de Poll collection which we bought from Messrs. O. E. Janson & Sons comprises a little over three thousand specimens, most of which came from the Oriental Region. The number of species is not large, the smaller forms particularly being but poorly represented. But there is some valuable material among them from localities whence few *Anthribidae* have been recorded. The undescribed species and varieties are not abundant in the collection, and many of those which are new were already known to me from other collections. As the specimens add to our knowledge of the distribution and variation of the *Anthribidae* and allow me to correct some errors, I propose to work out the Oriental forms as time permits and to publish the results, without, however, binding myself to any systematic sequence of the genera.

### I.

Genera: **Mecocerus**, **Physopterus**, **Eugigas**, **Meganthribus** and **Xenocerus**.

I have attended to these genera first for no other reasons than because they contain large species, are well represented in the collection, and their removal from the boxes facilitates the study of the smaller species. The genera dealt with in an article on the van de Poll *Anthribidae* are not necessarily closely allied.

Genus **Mecocerus** Schönh. (1833).

In both the *Catalogus Coleopterorum* of Gemminger and Harold (1872), and the *Catalogue des Anthribides* by A. Bovie (1905), *Acanthothorax longicornis* Gaede is quoted as being published in 1832 (*Mag. Zool.* vol. ii. t. 15), i.e. prior to Schönherr's vol. i., in which appeared the description of *Mecocerus*. Fahraeus, however, in Schönh. vol. v. p. 183, gives 1833 as the date of publication of Gaede's description, and Lacordaire in his *Gen. Col.* vol. vii. p. 496 says in a footnote that *Mecocerus* has several months' priority over *Acanthothorax*.

The species of *Mecocerus* fall into two groups, the frons being sulcate in the first group (nomenclatorially typical) and carinate in the second.

A. Frons sulcate.

1. **Mecocerus basalis** Jord. (1894).

Davao, Mindanao (Dr. Platen); 4 ♂♂ and 4 ♀♀.

Mindoro (Dr. Platen); 1 ♂.

The rostrum has no distinct dorso-lateral carinae and grooves. The ridge

which borders the triangular apical depression runs straight to the eye, bounding the median groove of the rostrum. The structure of the prosternum is also characteristic, as stated in *Nov. Zool.* 1894, p. 598. In the ♂ the bottom of the median cavity is longitudinally raised to some extent, so that there is a double impression in medium-sized ♂♂; and the transverse fold present in front of the coxae in small ♂♂ is much less distinct than in the allied species. The species was originally described from a pair labelled "Borneo." The examples came from Boucard's collection, and the locality is presumably erroneous. Whitehead collected a long series on Samar.

## 2. *Mecocerus philippinensis* Jord. (1895).

Manila; 1 ♂.

Mindoro (Dr. Platen); 1 ♀.

"Philippines"; 1 ♂ and 2 ♀♀.

The prosternal processes of the ♂ are placed nearer to the anterior margin of the prosternum than to the coxae. In small ♂♂, in which the processes and the cavity are absent, as well as in the ♀♀, the fold and transverse groove in front of the coxae are less strongly developed than in the following species. The disc of the pronotum is more strongly depressed than in the allied forms.

## 3. *Mecocerus brevipennis* Jord. (1894).

Kina-Balu, North Borneo (J. Waterstradt); 1 ♀.

Pangeralam, G. Dempo, Palembang, Sumatra, 2000—3000 ft., vii.-ix. 1890 (I. Z. Kannegieter); 1 ♂.

This species is recognised by the short elytra, the rather large scutellum, the deep sulcus of the frons, and the strongly developed carinae and grooves of the rostrum.

## 4. *Mecocerus wallacei* Pasc. (1860).

Doesonlanden, Borneo (C. Wahnes); 1 ♀.

Sintang, Borneo; 1 ♂.

## 5. *Mecocerus gazella* Gylh. (1833).

The commonest species in collections.

### 5a. *Mecocerus gazella gazella* Gylh. (1833).

This occurs in two forms which are so different in colour that one might almost mistake them for two distinct species. They occur together, and intermediates appear to be rare. True *gazella* (= *longicornis* Gaede) is ashy grey with very diffuse markings. The other form, which is the commoner one, is greyish clay-colour with more distinct markings. I propose to call this second form

### f. *lutosus* nov. (type: Tengger Mts.).

A series of both forms in the van de Poll collection.

f. *lutosus*:

Tambora, Sumbawa (H. Fruhstorfer); 1 ♂. Not previously recorded from any place east of Java.

Tengger Mts., East Java, 2000 ft. and 4000 ft. (H. Fruhstorfer); 3 ♂♂ and 2 ♀♀.

South Java, 1500 ft. (H. Fruhstorfer); 2 ♀♀.

Senggoro, Res. Pasoeroean (A. Koller); 24 ♂♂ and 12 ♀♀.

Goenong Kawi, Res. Pasoeroean (A. Koller); 1 ♀.

Tji Solak, Wynkoopsbaai (Grelak); 3 ♂♂.

f. *gazella* :

Djampang distr., W. Preanger (Prillwitz); 7 ♂♂ and 7 ♀♀.

Tji Solak, Wynkoopsbaai (Grelak); 3 ♂♂ and 1 ♀.

Goenong Tji Salimar, W. Preanger, 3000 ft., November 1890 (I. Z. Kannegieter); 1 ♂ and 1 ♀.

Mana-Riang, Ranau, Palembang, Sumatra, 2000—3000 ft., April 1890 (I. Z. Kannegieter); 1 ♀.

5b. *Mecocerus gazella paralius* subsp. nov.

♂ ♀. Similis f. *gazellae*, pube cinerea in elytrorum dimidio apicali minus densa vestitus, maculis nigris et griseis distinctioribus.

Hili Madjedja, North Nias, x.-xii. 1895 (I. Z. Kannegieter); 14 ♂♂ and 9 ♀♀.

Kandang Ampat, Padang Benedenlanden, v.-viii. 1898; 1 ♂.

Intermediate between the ashy grey form of *M. gazella gazella* and the next subspecies.

5c. *Mecocerus gazella guttatus* Jord. (1894).

Bedagei, East Sumatra, 600 ft., iv.-vi. 1889 (I. Z. Kannegieter); 2 ♂♂ and 11 ♀♀.

Pangeralam, Dempo, Palembang, 2000—3000 ft., vii.-ix. 1890 (I. Z. Kannegieter); 3 ♂♂ and ♀♀.

Soekaranda, Lankat-Deli, East Sumatra; 1 ♂ and 2 ♀♀.

Perak (W. Doherty); 1 ♂ and 2 ♀♀.

Singapore; 1 ♂.

5d. *Mecocerus gazella brunnescens* Jord. (1894).

Pengaron, South-East Borneo; 2 ♂♂.

Mt. Marapok, Dent Province, Brit. North Borneo; 4 ♂♂ and 4 ♀♀.

Brunei, North Borneo (J. Waterstradt); 9 ♂♂ and 8 ♀♀.

Kina-Balu, North Borneo; 2 ♂♂ and 2 ♀♀.

Banguay Is.; 3 ♂♂ and 1 ♀.

6. *Mecocerus allectus* Pasc. (1860).

Only one of the three subspecies of *allectus* is represented in the van de Poll collection.

6a. *Mecocerus allectus maculatus* Jord. (1894).

Victoria Point, Tenasserim; 1 ♂.

*B. Frons carinate.*7. *Mecocerus assimilis* Jord. (1895).

Elytra without tubercle in front of the apical declivity.

7a. *Mecocerus assimilis assimilis* Jord. (1895).

Senggoro, Res. Pasocroean (A. Koller) ; 1 ♂.

South Java, 1500 ft. (H. Fruhstorfer) ; 1 ♂.

Tengger Mts., East Java, 4000 ft. (H. Fruhstorfer) ; 1 ♀.

7b. *Mecocerus assimilis sumatranus* Jord. (1897).

Telaga Bodas, Preanger, Java, 5000 ft., i. 1891 (I. Z. Kannegieter) ; 1 ♂ and 1 ♀.

7c. *Mecocerus assimilis lituratus* subsp. nov.

♂ ♀. Sparsim albo et nigro maculatus, pronoti lineis nigris obsolescentibus.

Tondano, Minalhassa, North Celebes, vii.-viii. 1899 ; 1 ♂ and 1 ♀.

The pubescence of the upperside is uniformly clayish grey. The pronotum bears a white spot in the centre and three whitish obsolescent spots at the sides. The three black lines present on the pronotum of *M. a. assimilis* and *sumatranus* are only indicated at the base and apex, the median one being altogether absent in the ♀ before me. The dorsal carina is feebly angulate in the centre, the apex of the angle pointing frontad. The elytra are much more sparsely spotted than in *sumatranus* ; the third interspace bears three white spots and four or five black ones, the largest white spot being antemedian and the largest black one median ; the fifth interspace has three or four white spots and as many smaller black ones ; and the lateral margin has the same number of spots, the white submedian lateral one being the largest of them. The underside bears white lateral spots as in *sumatranus*, but the pubescence is not bright ochreous at the sides, as it is in that subspecies.

8. *Mecocerus simulator* Pasc. (1860).

Elytra with tubercle in the third interspace at the beginning of the apical declivity. Sometimes the tubercle is vestigial, but even in that case the third interspace is much broader in that place than the fourth.

There are two forms of this species in Borneo : true *simulator* resembling *M. wallacei* Pasc. (1860), and the other form closely agreeing in colour with *M. gazella brunescens* Jord. (1894). This second form is the only one we have from the Kina-Balu ; but it also occurs at Lawas and in Brunei, whereas from Kuching, Dutch Borneo, and the Malay Peninsula we have only true *simulator*. I name this form

f. *imitator* nov. (type : Kina-Balu).

The pubescence on the head and rostrum of f. *imitator* is usually ochreous ; the central stripe on the occiput widens more strongly than in f. *simulator* ; the light pubescence of the pronotum occupies about as much space as the dark pubescence, and the markings are very diffuse. The elytra are almost uniformly coloured from base to apex, being greyish clay or clayish grey, with the alternate interspaces



dotted with black from base to apex, the sutural interspace bearing ten to twelve dots and the others almost as many.

The van de Poll collection contains only two specimens of one form and one of the other, while there are numerous specimens of both in the Tring Museum.

f. *simulator* :

Pengaron, Martapoera, South-East Borneo; 1 ♂.

f. *imitator* :

Brunei, North Borneo; 1 ♂.

Mt. Marapok, Dent Province, Brit. North Borneo; 1 ♂.

### 9. *Mecocerus gibbifer* Jord. (1895).

Originally described from the "Philippines" from the Stettin Museum.

Mindoro (Dr. Platen); 2 ♂♂.

Davao, Mindanao (Dr. Platen); 1 ♂.

In the Tring Museum a number of specimens of both sexes from Samar and Leite, collected by J. Whitehead.

Broader than specimens of *M. simulator* Pasc. (1860) of the same length; the third interspace of the elytra more elevate and the tubercle higher as a rule. The markings are sharply defined, and on the pronotum and elytra the black, more or less confluent, spots occupy about as much space in the aggregate as the luteous spots, which stand more or less isolated on the elytra. The alternate interspaces (2, 4, 6 and 8) are more extended black than luteous, but also bear luteous spots and are encroached upon by the luteous markings of the adjacent interspaces. There is a larger luteous spot on the suture behind the scutellum and the posterior half or three-fifth of the sutural interspace is almost regularly tessellated black and luteous. The sterna bear large black spots, which are often confluent, and the abdominal segments are black at the base, the black colour frequently being so extended that the light-coloured pubescence is broken up into spots.

### Genus *Physopterus* Iac. (1866).

The genus was based on a single species, *gibbosus* Guér. (1843), in which the elytra are much swollen posteriorly and flattened anteriorly and the antennae are rather stout. The species has a very different facies from the normal species of *Mecocerus* on the one hand and *Phloeophilus agrestis* Schönh. (1833) on the other. Among the species which I have described as *Physopterus*, however, there are several which form connecting links and render it difficult to decide where to draw the dividing line between the three genera. Having now before me all the known species and some new ones of these genera, it appears to me advisable to unite *Phloeophilus* and *Physopterus*, but to keep *Mecocerus* separate.

*Phloeophilus* Schönh. (1833) spelt with an *e* has been considered preoccupied by *Phloiophilus* Steph. (1830), and to replace it the new name *Lemmophilus* was proposed by Rye, and a little later *Platynorrhynchus* by Gemminger and Harold (Chevr. in litt.), both dating from 1872, i.e. being six years later than *Physopterus*. Although I personally would prefer the employment in *Anthribidae* of *Phloeophilus* in spite of the earlier *Phloiophilus*, the general tendency among

systematists appears to be to regard such names as identical, the *i* in *Phloiophilus* being a mere error of transcription. For that reason I waive my own inclination and adopt for *Phloeophilus* Schönh. (1833) the name which comes next in priority, this being *Physopterus*.

In all the species of *Physopterus* a ridge runs from the centre of the oblique anterior edge of the eye to the upper edge of the antennal groove, there being a depression or groove above and below this lateral ridge. The upper one of these grooves is usually bounded dorsally by a further ridge, which is a prolongation of the dorsal edge of the eye, and as a rule stops short about half-way to the apex of the rostrum. The antenna of the ♂ is in most species stouter and shorter, and the club is broader and flatter in the ♀, than in *Mecocerus*. The first segment of the foretarsus is at most a little longer than the fourth, never being so much prolonged as in all the ♂♂ of *Mecocerus*. The rostrum bears at the base a deep median sulcus which usually extends well on to the frons.

### 1. *Physopterus opulentus* spec. nov.

♂♀. Niger vel brunneus, pube olivaceo-ochracea tectus, guttis numerosis nigro-brunneis parce griseo pubescentibus ornatus, antennis pedibusque brunneorufis, femoribus brunneis, antennarum clava nigra. Rostrum latitudine longius. Frons in medio carinata, antice cum rostro sulcata. Elytra antice valde depressa, postice gibbosa, tuberculo rotundato in spatio tertio sito instructa.

Long. (cap. excl.) 7·5—8·5 mm.

Kina-Balu, North Borneo; 1 ♂ and 2 ♀♀.

A third ♂ (much worn) in the Tring Museum from the same place.

The rostrum is half as long again as it is broad distally, and has strongly marked carinae. The apex of segment 4 of the antennae and in ♀♀ (and the brachycerous ♂) the entire 8th and the base of 9 pubescent white. The pronotum is as broad as it is long in the ♂ and a little broader in the ♀, being conical from the carina forward; it is minutely punctured, but otherwise smooth, bearing neither tubercles nor grooves, and has about thirteen brown spots, some of which are united with one another. The elytra are broader at the base than the pronotum, being wider than in *P. gibbosus* Guér. (1843), and become gradually broader and higher, being widest and highest at five-sevenths, where each bears a rounded tubercle, accompanied laterally by faint vestiges of other tubercles; the brown spots, which bear a minute grey pubescence, are more or less arranged in irregular transverse rows, and many are joined together.

The underside is spotted with black-brown laterally. The ♂ bears a medianly divided pubescent central spot on the metasternum, and has the edges of the abdominal segments slightly incrassate in the middle. The first foretarsal segment is as long as the claw-joint or a little longer.

Differs considerably from all the other species of *Physopterus* in the pattern of the upperside, and is also otherwise easily recognised by the comparatively long rostrum being strongly carinate.

### 2. *Physopterus maculifer* Jord. (1894).

Snkabumi, West Java, 2000 ft. (H. Fruhstorfer); 1 ♂.

3. *Physopterus alboguttulatus* Jord. (1894).

Tengger Mts., East Java, 4000 ft. (H. Fruhstorfer); 3 ♂♂ and 2 ♀♀.

Sukabumi, West Java, 2000 ft. (H. Fruhstorfer); 1 ♂.

Senggoro, Res. Pasoeroean, Java (A. Koller); 1 ♀.

These specimens bear white dots. The following examples, which have yellow dots, may represent a distinct race:

Pengalengan, West Java, 4000 ft. (H. Fruhstorfer); 2 ♂♂.

Palabuan, South Java (H. Fruhstorfer); 1 ♀.

Bedagei, East Sumatra, 600 ft., iv.-vi. 1899 (I. Z. Kannegieter); 1 ♂.

4. *Physopterus sumatranus* Jord. (1897).

Perak (W. Doherty); 1 ♂ and 1 ♀.

5. *Physopterus tuberculatus* Jord. (1894).

Belipul-Oya, Ceylon, iv.-vi. 1889 (I. Z. Kannegieter); 1 ♂.

6. *Physopterus pardalis* Jord. (1912).

Perak (W. Doherty); 1 ♀.

This is only the second specimen known to me.

Genus *Eugigas* Thoms. (1857).

The genus contains the largest of all *Anthrribidae*.

1. *Eugigas schoenherri* Thoms. (1857).

Astrolabe Bay, German New Guinea (Rhode); 2 ♀♀.

Ureiuning, Aru Is. (C. Ribbe); 1 ♂ and 1 ♀.

2. *Eugigas goliathus* Thoms. (1857).

Tji Solak, Wynkoopsbaai, Java (Grelak); 1 ♂ and 1 ♀.

Kawie Mts., Pasoeroean, Java; 1 ♂.

South Java, 1500 ft. (H. Fruhstorfer); 1 ♂.

Hili Madjedja, North Nias, vii.-ix. 1895 (I. Z. Kannegieter); 2 ♀♀.

Padang Sidempoean, West Sumatra (J. D. Pasteur); 1 ♀.

Borneo; 1 ♂ and 1 ♀.

Genus *Meganthribus* gen. nov.

*Dolichocera* Gray (nec Latr., 1829), in Griff., *Arim. Kingd.* vol. xv. Ins. p. 65 (1832) (indescr.).

Differs from *Eugigas* in the buccal plate being evenly excised and the tarsal claws not bearing a tooth.

Type of name: *sulphureus* Waterh.

In the ♂♂ of *Eugigas* the last three antennal segments are together only about as long as segment 8, while in *Meganthribus* they are about twice as long as 8.

1. *Meganthribus sulphureus* Waterh. (1876).

Andaman Islands; 4 ♂♂ and 5 ♀♀.

The species is only known from the Andamans. It is easily recognised, for which reason I have chosen it as the type of the new generic name.

2. *Meganthribus childreni* Gray (1832).

Pengalengan, West Java, 4000 ft. (H. Fruhstorfer); 1 ♀.

In true *childreni* the elytra are distinctly depressed along the suture. The sterna bear lateral patches, which vary from orange to greyish yellow and are more or less bordered with grey. The central portion of the pro- and mesosterna is black, with the exception of the mesosternal process. The groove along the apical margin of the metasternum is very deep; it curves forward medianly, but is not angulate, not encroaching upon the intercoxal process of the metasternum.

The following insect is possibly a form of *childreni*, but as the new insect, according to the van de Poll collection, also occurs on Java, the home of *childreni*, it is advisable to treat it for the present as a distinct species.

3. *Meganthribus euspilus* spec. nov.

♂♀. *M. childreni* valde affinis, prothorace elytrisque latioribus, elytris ad suturam vix impressis, interstitiis alternis conspicue albo et nigro tessellatis, pronoto albo guttato.

Manna, Sumatra (M. Knappert); 1 ♂ (type).

Telaga Bodas, Garoet Preanger, Java, 4000—5000 ft., i. 1891 (I. Z. Kannegieter); 1 ♂ and 1 ♀.

In the Tring Museum also from Perak and Bolok-Baros, Medan, Sumatra.

The upperside uniformly and densely pubescent tawny-olive, usually more olive than tawny, with prominent black and white markings. The white spots on the elytra more numerous than in *M. childreni*, especially in the sutural interspace. The base of the second segment of the foretarsus conspicuously white like that of the first segment, but the white colouring more restricted. The abdomen of the same yellow tint as the sterna, with conspicuous white lateral dots, the bases of the segments also being white.

I should have treated this form as a geographical race of *M. childreni*, if it was not for the Javan specimens in coll. van de Poll. The labelling of the two examples, however, may be erroneous; at any rate, it would be desirable to see the record from Java confirmed.

4. *Meganthribus atopus* spec. nov.

♀. Etiam affinis *M. childreni*, cujus varietas geographica verisimiliter est. Supra fulvo-olivaceo pubescens, albo guttatus, prothorace lineis duabus angustissimis valde interruptis nigris ornato, elytris ad suturam vix depressis, interstitio suturali sparsim albo vix nigro guttato, abdomine utrinque duabus seriebus guttarum albarum ornato.

Tondano, Minahassa, North Celebes; 1 ♀.

The black markings are less numerous and also smaller than in *M. childreni* and *euspilus*, being partly suppressed by the greater development of the tawny-olive pubescence. The white markings stand out very distinctly; those on the thorax are smaller than in the forms mentioned, the central spot being elongate-

ovate, and there being no white pubescence at the dorsal carina. On the elytra both the white and black markings are restricted in number; the sutural space bears some white dots, but all its black spots are suppressed; the white lateral spot situated behind the shoulder is circular and wider than one interspace. The sterna bear conspicuous and sharply defined white spots. The abdomen is coloured like the sterna; the pubescence at the bases of the segments is not white, but there is a rounded spot near the base of segments 2—4, about half-way between the centre and the lateral row of white spots. The second foretarsal segment has hardly any white pubescence at the base, and the white colouring is also not much in evidence on segments 7 and 8 of the antenna.

##### 5. *Meganthribus nubilus* Jord. (1898).

Tandjong Morawa, Serdang, N.E. Sumatra (Dr. B. Hagen); 1 ♂.

Brunei, N. Borneo; 1 ♂.

Kina-Balu, N. Borneo; 1 ♀.

A shorter and broader species than *M. childreni*. The apical transverse groove of the metasternum is almost obsolete in between the midcoxae, being here distinctly angulate. The transverse fold behind the groove of the mesosternum is narrower than in *M. childreni*, *euspilus* and *atopus*, and the groove behind the forecoxae deeper.

##### 6. *Meganthribus pupa* Jord. (1895).

Luzon; 1 ♂.

Mindoro (Dr. Platen); 1 ♂.

Davao, Mindanao (Dr. Platen); 1 ♂.

Salibaboe, Talaut Is., March (W. Doherty); 2 ♂♂.

Ilat, Boeroe, January (W. Doherty); 2 ♂♂.

Kairatoo, West Ceram, ii.—iii. 1892 (Martin); 1 ♀.

A robust species. The metasternum has no groove at the apex between the midcoxae. The mesosternum is rather coarsely punctured in front of the coxae on the neck-like portion fitted into the prothorax.

The pair described by me as *whiteheadi* (1895), from North Luzon, appears to be a variety, perhaps a geographical one, of *M. pupa*.

The above example from Mindoro, the only one I have seen, is more elongate than the specimens we have from other places, and the two grooves of the pronotum are a trifle deeper.

The mesosternal process is rather strongly convex in the specimens from the Philippine and Talaut Islands, with the exception of the above examples from Luzon and Mindanao.

##### *Mecotropis* Lac. (1867).

The genus consists of three sections, which are apparently well-defined. The van de Poll collection contains examples of the majority of the species.

A. Median groove of rostrum continued on the frons; anterior margin of eye straight.

##### 1. *Mecotropis variegatus* Oliv. (1795).

Leitimor, Amboina, x.—xii. 1897; 1 ♂ and 1 ♀.

Occurs also on Buru.

2. *Mecotropis insignis* Pasc. (1860).

Leitimor, Amboina, x.-xii. 1897; 4 ♂♂ and 2 ♀♀.

Leitimor, Amboina, xii. 1891 (Martin); 2 ♂♂.

Kainatoo, West Ceram, ii.-iii. 1892 (Martin); 6 ♂♂ and 4 ♀♀.

Honitotoe, West Ceram, iii. 1892 (Martin); 1 ♂.

Wahaai, North Ceram, iv. 1892 (Martin); 1 ♀.

3. *Mecotropis annulipes* Jord. (1911).

Brunei, Borneo; 1 ♀.

4. *Mecotropis fruhstorferi* Jord. (1894).

South Java, 1500 ft. (H. Fruhstorfer); 1 ♂.

Senggoro, Res. Paseroean, Java (A. Koller); 3 ♂♂.

5. *Mecotropis similis* Jord. (1898).

Senggoro, Res. Paseroean, Java (A. Koller); 1 ♂.

Badagei, East Sumatra, 600 ft., iv.-vi. 1889 (I. Z. Kannegieter); 1 ♂.

6a. *Mecotropis caelestis caelestis* Jord. (1898).

Palawan; 2 ♂♂.

The pubescence on the sides of the sterna is ochraceous in the two examples, which is not the case in the unique type-specimen from Samar.

6b. *Mecotropis caelestis megapsis* subsp. nov.

♀. Latior quam *M. c. caelestis*, colore nigro multo magis extenso.

Salibaboe, Talaut Is., iii. (W. Doherty); 1 ♀.

The markings of the upperside, especially on the elytra, are less blue than in the specimens from the Philippines, and much reduced, the network being much more open and almost everywhere interrupted. Apart from the borders to the eyes, the frons has no blue or greyish markings, and the occiput only bears a minute median spot. The scutellum has a black dot. The black colour is also more extended on the pygidium and under surface.

7. *Mecotropis pardalis* spec. nov.

♂. Niger, pube lutea dense vestitus, supra multis maculis nigris notatus, subtus sparsim nigro guttatus; rostro cum fronte capitis sulco mediano instructo, antennarum articulis 3<sup>o</sup>-8<sup>o</sup> apice albo pubescentibus, tibiis brunneo-rubris.

Long. (cap. excl.) 11 mm.

Tondano, Minahassa, North Celebes, vii.-viii. 1899; 1 ♂.

The base of the femora and the entire tibiae are rather bright red, the antennal segments 6 to 9 (with the exception of the widened apical portion of 9) are similarly coloured, but have a browner tint. The apex of the first tarsal segment is pubescent-white like the apex of segments 3 to 8 of the antenna. The rostrum is about as long as it is broad near the apex, being shorter than in *M. variegatus* Oliv. (1795); its median groove is wide at the base of the rostrum and the beginning of the frons. The pronotum is shorter than in *M. variegatus*, being broadest a little in front of the

centre, and a trifle wider than it is long. The median portion of the notum is feebly elevate and bounded on each side by a slight though distinct depression. Scutellum luteous. The dots on the elytra are numerous and nearly all separated, each elytrum bearing a longitudinal row of three dorsal as well as three or four lateral spots, which are larger and irregular, being evidently composed of confluent dots. On the underside there are blackish brown dots at the sides of the sterna and abdomen, the latter bearing two rows from segment 2 to 4.

8. *Mecotropis icanus cordiger* subsp. nov.

♀. Pronoto pone tuberculum medianum haud punctato et elytrorum area apicali grisea antice ad suturam sinuata distinctus.

Soekaboemi, West Java, 2000 ft. (H. Fruhstorfer); 1 ♀.

In the Tring Museum a second ♀ labelled Java.

*B.* Groove of rostrum continued on the frons. Eye sinuate.

9a. *Mecotropis maculosus brevirostris* Jord. (1894).

Ilat, Boeroe, i. (W. Doherty); 3 ♂♂ and 3 ♀♀.

Leitimor, Amboina, xii. 1891 (Martin); 1 ♀.

One of the ♂♂ is a peculiar aberration, the markings of the upperside being almost entirely obliterated with the exception of the median stripe on the head and pronotum.

9b. *Mecotropis maculosus maculosus* Pasc. (1860).

Kairatoe, West Ceram, ii.-iii. 1892 (Martin); 1 ♂.

Illo, Ceram (C. Ribbe); 1 ♂ and 1 ♀.

This form bears a remarkably close likeness to *M. insignis* Pasc. (1860), while *brevirostris* resembles *M. variegatus* Oliv. (1795).

10. *Mecotropis spilosa* Jord. (1903).

Palawan; 1 ♀.

Resembles *M. caelestis* Jord. (1898), but the markings of the upperside are yellowish and the light-coloured parts of the underside and legs grey or nearly pure white, not blue as in *caelestis*.

11. *Mecotropis marmoreus* Jord. (1895).

Brunei, Borneo; 2 ♂♂ and 4 ♀♀.

12. *Mecotropis whiteheadi mindorensis* subsp. nov.

♂ A *M. w. whiteheadi* differt vittis nigris pronoti extus valde irregularibus, elytrorum limbo griseo basali in vittam brevissimam suturalem duas guttas anteriores attingentem producto.

Mindoro (Dr. Platen); 1 ♂.

The clayish grey median stripe of the pronotum is slightly widened in the centre, and the lateral stripes invade the black dorsal areas in front of and behind the middle. The basal border of the elytra is slightly wider below the

shoulders than in *M. w. whiteheadi*, and is produced along the suture in between the dorsal spots, which are slightly connected with this short sutural stripe. The median spot of the elytrum is longer transversely than in *whiteheadi*.

*C. Frons carinate. Eyes non-sinuate.*

13. **Mecotropis arcifer** Jord. (1894).

Batjan; 1 ♀.

14. **Mecotropis pantherinus** Thoms. (1857).

Andai and Humboldt Bay, Dutch New Guinea (W. Doherty); 1 ♂ and 2 ♀♀. Stephansort, Astrolabe Bay, German New Guinea (Kunzmann); 1 ♀.

Genus **Xenocerus** Schönh. (1833).

The numerous species fall into several natural groups which are distinguished by the different structure of the male antennae. It is not always easy to place a species, if it is only known from the ♀.

The genus is represented from Ceylon to the Solomon Islands, but in the Lesser Sunda Islands it is only known as far east as Alor, no specimens having been as yet recorded from Timor, Timorlaut and the islands in between.

1. **Xenocerus speciosus** Jord. (1898).

Kalim Bungo and Dyma, Northern Nias, second half of 1894, and from iii.-v. 1895 (R. Mitschke).

A long series of both sexes. The species varies but slightly. In one of the ♀♀ the black median patches of the elytra are only half the normal size.

2. **Xenocerus andamanensis** Jord. (1894).

Andaman Islands; 2 ♂♂ and 3 ♀♀.

The sutural vitta slightly varies in width, and the postmedian dot, which is confluent with it, sometimes extends to the sixth interspace.

3. **Xenocerus saperdoides** Gylh. (1833).

This species varies geographically. The van de Poll collection contains two subspecies of it:

3a. **X. saperdoides saperdoides** Gylh. (1833).

Senggoro, Res. Pasoeroean, Java (A. Koller), Palaboean, Southern Java (H. Fruhstorfer), and Tji Solak, Wynkoopsbaai, Java; 2 ♂♂ and 4 ♀♀.

The yellowish markings of the elytra are usually all united with one another, but the apical discal streak is sometimes disconnected.

3b. **X. saperdoides simplex** Jord. (1894).

Sintang, Borneo; 1 ♂.

Mana Riang, Palembang, 2000—3000 ft., April 1890 (I. Z. Kannegieter); 1 ♂ and 1 ♀.



Hili Madjedja, Northern Nias, late in 1895 (I. Z. Kannegieter); 1 ♂.

This form was originally described as a distinct species from a single North Bornean ♀. Although none of the ten specimens now before me from Dutch Borneo, Sumatra, the Malay Peninsula, Cochinchina, and Nias agree exactly with that example, it appears to me advisable to keep these specimens under the name of *simplex* until further material from North Borneo proves the specimens of that district to conform to the type of *simplex*.

4. *Xenocerus mamillatus* Jord. (1903).

Kina-Balu, North Borneo; 1 ♀.

This specimen, as well as another ♀ in the Tring Museum from Malacca, is slenderer than the unique name-type from Pontianak, and the lateral lines on the prothorax and elytra are thinner.

5. *Xenocerus pictus* Kirsch (1877).

Perak (W. Doherty); 4 ♂♂ and 8 ♀♀.

The species is only known from the Malay Peninsula.

6. *Xenocerus ornatus* Jord. (1897).

Tandjong Morawa, Serdang, N.E. Sumatra (B. Hagen); 2 ♀♀.

I described the species from a single specimen in the Genoa Museum, but we have since received 2 ♂♂ and 3 ♀♀ from West Sumatra. In the above 2 ♀♀ obtained by Dr. Hagen the lateral stripes of the pronotum and the yellowish spots of the elytra are rather larger than in the West Sumatran examples.

This species is close to *X. pictus* Kirsch (1877), although it has a rather different facies on account of the punctures of the elytra being pubescent white.

7. *Xenocerus rectilineatus* Jord. (1894).

Darjiling; 1 ♂.

No locality; 3 ♂♂ and 1 ♀.

8. *Xenocerus scalaris* Jord. (1894).

Davao, Mindanao (Dr. Platen); 3 ♂♂ and 1 ♀.

9a. *Xenocerus barbicornis virgatus* subsp. nov.

♂. Vittis elytrorum latis, dorsali cum fascia transversa una, metasterno macula nigra laterali parva, abdomine in medio sparsim albescente.

Philippine Islands; 1 ♂ (apparently from coll. Semper).

The dorsal stripe of the elytrum is about as broad as the space which separates it from the sublateral stripe, and the transverse band is completely united with it, the black sutural space being spear-shaped and narrower than one dorsal interspace; the sublateral stripe is likewise broader than in true *barbicornis* and joins the outer branch of the dorsal stripe behind the shoulder-angle, the black subbasal dorsal swelling of the elytrum being completely encircled by white. The white spots of the pygidium extend from the base to the apex. The white lateral stripe of the

prosternum is broader than the black stripe situated above it, and the metasternum is entirely white with the exception of a median patch and a small round lateral spot.

9b. *Xenocerus barbicornis barbicornis* Gestro (1879).

Astrolabe Bay, German New Guinea (Rhode); 1 ♀.

Stephansort, Astrolabe Bay (Kunzmann); 1 ♀.

10. *Xenocerus variabilis* Pasc. (1860).

Kina-Balu, North Borneo; 1 ♂.

Brunei, Borneo; 1 ♂ and 3 ♀♀.

Doesonlanden, Borneo (Wahnes); 1 ♀.

Mt. Marapok, Dent Province, Brit. North Borneo; 1 ♀.

Palawan; 1 ♂.

The brown markings are sometimes separated into more or less well-defined spots.

11. *Xenocerus mesites* spec. nov.

♂ ♀. Supra nigro-branneus, subtus albus, antennarum articulo 3<sup>o</sup> in ♂ brevi atque 5<sup>o</sup> piloso, in ♀ 4<sup>o</sup> tribus praeedentibus longitudine aequali; pronoto trivittato, elytris vitta suturali post medium biramosa, linea discali a basi ad medium extensa ad marginem basalem cum vitta suturali conjuncta atque pone basin in ramum brevem versus suturam directam dilatata, linea sublaterali aut interrupta aut completa luteo-albis signatis.

Long. (cap. excl.), 8.5—14 mm.

Ternate, *type*, in Mus. Tring; 4 ♂♂ and 1 ♀.

Aru; 1 ♂ in Mus. Tring, and 2 ♀♀ in coll. van de Poll.

The specimens are very close to *X. conjunctus* Jord. (1895), from New Guinea, and perhaps only subspecifically distinct. However, the fifth segment of the antenna is pilose on the outside in the ♂♂ of *mesites*, while it is naked in the two ♂♂ which we have of *conjunctus*. Further material of *conjunctus* may prove that this difference does not hold good. In pattern *mesites* differs from *conjunctus* especially in two points. The discal line in the basal half of each elytrum is connected behind the base with the sutural stripe in *conjunctus*, while in *mesites* the line only bears a short branch which does not reach the sutural vitta; further, the lateral apical line ends at the sutural edge in *conjunctus* and at the apical edge in *mesites*. In both species the suture is narrowly edged with white posteriorly.

12. *Xenocerus platyzona* spec. nov.

♂. Niger, albonotatus, antennarum (♂) articulis 2<sup>o</sup> et 5<sup>o</sup> pilosis, pronoto trivittato, vittis antice posticeque abbreviatis, elytris fascia transversa latissima ad suturam antrorsum producta, maculis tribus una ad basin juxta humerum atque duabus in utroque elytro ante apicem sitis, linea parva suturali antepicali.

Long. (cap. excl.): 15 mm.

Davao, Mindanao (Dr. Platen); 1 ♂.

(closely resembles *X. latifasciatus* Jord. (1894) in pattern, but at once distinguished by the pilose second and fifth antennal segments (♂), the three white

stripes of the pronotum, the humeral spot of the elytra, the more elongate prothorax and elytra, etc.

The head bears a white lateral stripe above and below, the dorsal stripes being interrupted anteriorly between the eyes. The median stripe of the pronotum extends from near the apical margin to the carina and is narrowest in the centre; the side stripes are elongate bean-shaped, being shorter than the median stripe and narrowing somewhat posteriorly. The band of the elytra is broad at the suture, where it is produced forward to near the scutellum, its edges being sinuous; at the fourth line of punctures it occupies rather more than one-third the length of the elytra; in the black apical area there is a subapical transverse spot on each elytrum, and half-way between it and the band a sublateral dot. The pygidium has a triangular spot on each side. The prosternum bears a broad interrupted lateral stripe and in the central portion sparse white pubescence. The mesosternite has a lateral spot which occupies the whole epimerum and part of the episternum, also entering upon the episternum of the metathorax; moreover, there is in front of this spot a detached round one. The metasternum is sparsely pubescent white, the episternum and lateral portion of the sternum remaining black. The abdomen likewise bears white pubescence, which is condensed into sharply defined bands at the sides. The femora bear a black patch; the bases of tarsal segments 1, 2 and 4 are white.

13. *Xenocerus longicornis* Jord. (1894).

Tondano, Minahassa, North Celebes, vii.-viii. 1899; 3 ♂♂ and 3 ♀♀.

14. *Xenocerus fimbriatus* Pasc. (1860).

Sintang, Dutch Borneo; 1 ♀.

Brunei, Borneo; 1 ♂.

15. *Xenocerus velutinus* Gestro (1876).

Korrido, Geelvink Bay, Dutch New Guinea (Beccari); 1 ♂ and 1 ♀, paratypes.

16. *Xenocerus everetti* Jord. (1894).

Brunei, North Borneo; 1 ♀.

Dyma, Northern Nias, iii.-v. 1894 (R. Mitschke) and Hili Madjedja, Central Nias, late in 1895 (I. Z. Kannegieter); a long series of both sexes.

One ♀ from Tondano, Minahassa, North Celebes, vii.-viii. 1899, which is a new record for this species.

A series from Senggoro, Res. Paseroean, Java (A. Koller) and South Java, 1500 ft. (H. Fruhstorfer).

The species does not seem to have split up into geographical races. The specimens vary remarkably in size, our largest example measuring 28 mm. in total length, and the smallest 12 mm.

17. *Xenocerus russatus* Jord. (1911).

Mt. Marapok, Dent Province, North Borneo; 1 ♀.

Pengaron, Martapoera, S.E. Borneo; 1 ♂.

18. *Xenocerus fruhstorferi* Jord. (1894).

Sukabumi, West Java, 2000 ft. (H. Fruhstorfer); 2 ♂♂ and 3 ♀♀.

19. *Xenocerus decemguttatus* Jord. (1895).

Goenoeng Talang, Padang Bovenlanden, Snnatra, early 1899; 2 ♂♂ and 2 ♀♀.

Goenoeng Agoeng, Palembang, Snnatra, 4000-5000 ft., August 1890 (I. Z. Kannegieter); 1 ♀.

20. *Xenocerus tephros* spec. nov.

♂. Niger, capite cum rostro et pygidio luteo-pubescentibus, scutello eodem colore, pronoto et elytris omnino cinereis absque signaturis, antennis simplicibus segmento 3<sup>o</sup> brevi.

Long. (cap. excl.) 15 mm.

Perak (W. Doherty); 1 ♂.

Not very nearly allied to any of the other known species, and easily recognised by the uniformly ashy grey pronotum and elytra.

The head and rostrum are yellowish clay-colour above with a black median stripe, and bear a patch of the same pubescence underneath at the sides. The antenna is entirely black, non-pubescent with the exception of the last two segments, which bear minute hairs; segment 3 short, 2 to 9 more or less compressed, granulose, sulcate on the inner side. Prothorax much longer than broad. Elytra broadly depressed at the suture, impressed on the declivous apical area near the suture and somewhat less strongly outwardly, so that a very obtuse ridge is formed on each elytrum.

The underside is pubescent ashy grey; the centre of the prosternum bare of pubescence, convex and studded with granules. The tibiae and tarsal segments are black at the apices.

21. *Xenocerus fastuosus* Gestro (1876).

Korido, Geelvink Bay, Dutch New Guinea (Beccari); 2 ♂♂ and 2 ♀♀, paratypes.

22. *Xenocerus bicinctus* Jord. (1894).

Salibaboe, Talaut Islands, March (W. Doherty); 3 ♂♂ and 2 ♀♀.

23. *Xenocerus latifasciatus* Jord. (1894).

Manila (Semper); 1 ♂ and 1 ♀.

24. *Xenocerus epomis* spec. nov.

♀. Nigro-velutinus, antenna cylindrica, capite albo-bivittato, prothorace vitta media abbreviata atque macula subovata dorso-laterali albis notato, elytris plaga magna humerali, fascia transversa completa postmediana guttaque apicali primulinis ornatis, prosterno fascia transversa, mesepimero macula angusta, metasternoque fascia transversa in medio interrupta albis signatis, segmentis abdominalibus 2°-4° ad apicem atque pedibus plus minusve griseo-albis.

Long. (cap. excl.) 11.5 mm.

Salibaboe, Talaut Islands, iii. (W. Doherty); 1 ♀.

Similar to *X. bicinctus* Jord. (1894), from the same locality, but differs in the pronotum bearing a white median stripe, the elytra a large shoulder-patch in place of a subbasal band, the broad white transverse bands on the pro- and metasterna, the diffuse but broad borders to the third and fourth abdominal sternites, etc.

The white stripes on the head reach to the apex of the rostrum; they are narrowed, but not interrupted, on the anterior portion of the frons. The bases of segments 4 and 5 of the antenna and the entire segments 7 and 8 are white. The median stripe of the pronotum tapers at both ends and reaches neither apex nor base, being centrally as broad as the space which separates it from the dorso-lateral spot. This spot is slightly yellow behind, elliptical, with the upper edge almost straight, its longitudinal diameter being a little longer than the distance of the spot from the apical margin.

The yellow colour of the markings of the elytra may be an individual character; the humeral patch extends to the first row of punctures, not counting the scutellar row, and its posterior edge is almost semicircular, but somewhat ragged; the humeral angle itself black; the postmedian band broader than in *X. bicinctus* and the apical spot touches the apical margin. The pygidium bears a small spot on each side at the base.

The band of the prosternum is almost interrupted in the centre and extends laterally to the subbasal depression, being traversed by a black line from the coxa upwards, the line corresponding to the meral suture. The elongate lateral spot on the mesosternite does not quite occupy the entire epimerum. The transverse fascia of the metasternite is broad and in the centre rather widely interrupted. The abdominal sternite 2 bears sparse white pubescence near the apical margin, while the next two segments have a broad but somewhat diffuse band from side to side.

The legs are entirely but not very densely pubescent greyish white, with black apices to the tibiae and to the tarsal segments.

#### 25a. *Xenocerus lacrymans lacrymans* Thoms. (1857).

Andai, Roon and Kapanr, Dutch New Guinea (W. Doherty); 2 ♂♂ and 3 ♀♀  
Ureiuning, Aru Islands (C. Ribbe); 1 ♂ and 1 ♀.

#### 26. *Xenocerus striatus* Jord. (1894).

Davao, Mindanao (Dr. Platen); 5 ♂♂ and 1 ♀.

One of the ♂♂ agrees with the type, while the other five examples approach *X. compressicornis* Jord. (1894), the sutural vitta being continued obliquely to the outer margin. It is probable that *striatus* and *compressicornis* are forms of one geographically and individually variable species.

#### 27. *Xenocerus cinctus* Jord. (1894).

Toli-Toli, North Celebes, xi.-xii. 1895 (H. Fruhstorfer); 1 ♂.

The specimen agrees with the examples from Amboina, whence came the name-type and the other specimens which I have seen.

28. *Xenocerus arciferus* Blanch. (1853).

Honitetoë, West Ceram, iii. 1892 (Martin); 1 ♂.

Ilat, Boeroë, i. (W. Doherty); 1 ♂.

In the example from Boeroë (= Buru) the subapical white bar is absent. The single other specimen in the Tring Museum from that island, but from an altitude of about 3000 ft., is a ♀ in which the bar is present. The example from the coast (Ilat) represents perhaps a distinct subspecies.

29. *Xenocerus niveofasciatus* Gestro (1876).

Mafor, Geelvink Bay, Dutch New Guinea (Beccari); 2 ♂♂ and 2 ♀♀, paratypes.

30. *Xenocerus corae* Gestro (1876).

Andai, Dutch New Guinea (W. Doherty); 2 ♂♂ and 3 ♀♀.

Andai, viii. 1892 (d'Alberty); 1 ♂ and 1 ♀, paratypes.

31. *Xenocerus laevicollis* Jord. (1894).

Mt. Marapok, Dent Province, Brit. North Borneo; 1 ♂ and 1 ♀.

Bruuei, North Borneo; 3 ♂♂.

32. *Xenocerus licheneus* spec. nov.

♀. Niger, densissime luteo-albo pubescens, antennis haud penicillatis, prothorace tribus vittis nigris quarum media lata ornato, clytris macula semicirculari scutellari, altera laterali submediana atque area apicali nigris notatis, segmento ultimo ventrali atro.

Long. (cap. excl.): 15 mm.

Hili Madjedja, North Nias, x.-xii. 1895 (I. Z. Kannegieter); 1 ♀.

In facies similar to *X. speciosus* Jord. (1898), but quite different in the structure of the antenna and the position of the black markings. I expect the ♂-antenna to have the third segment long, as in *X. flagellatus*.

Antenna black, the bases of segments 4 and 5 and the entire segments 7 and 8 white, 2 and 3 equal in length, 4 and 5 slightly compressed, pubescence appressed, smooth. The black central stripe of the pronotum rounded at the sides, slightly narrower in front than behind, the median depression only distinct posteriorly, the black lateral stripe enclosing the carina of even width from apex to base, about half the width of the buffish white dorso-lateral stripe. The basal spot surrounding the scutellum semicircular, velvety black like the other markings of the upperside, reaching nearly to the second line of punctures not counting the scutellar line; scutellum also black; a submedian patch extending from near the third line of punctures to the lateral margin, where it is broadest, its anterior edge sinuous, posterior edge obliquely incurved dorsally; declivous apical area entirely velvety black, the longitudinal diameter of this patch about as long as the distance from the submedian spot, the patch slightly denticulate, with a larger tooth in second line of punctures, a triangular sinus upon suture, an incision near margin and a linear marginal projection extending to near median spot.

Median portion of mesosternite exclusive of intercoxal process black, anterior

side of midcoxa brown. Legs pubescent like body, the chitin of the tibiae slightly reddish, the tibiae and tarsal segments 1 and 4 at apex, and tarsal segments 2 and 3 entirely black.

33. *Xenocerus discrepans* Jord. (1895).

Southern Palawan (J. Waterstradt); 1 ♂ and 2 ♀♀.

The third segment of the ♂-antenna is long, as in *X. flagellatus* Fahrs. (1839).

34. *Xenocerus humeralis* Gestro (1876).

Korido, Geelvink Bay, Dutch New Guinea, iv. 1875 (Beccari); 1 ♂ and 1 ♀, paratypes.

35. *Xenocerus sambawanus* Jord. (1895).

Aroe Hassa, Sambawa, 2000—5000 ft., ix.—x. (W. Doherty); 1 ♂ and 2 ♀♀. Tambora, Sambawa (H. Fruhstorfer); 3 ♂♂ and 4 ♀♀.

36. *Xenocerus puncticollis* Jord. (1894).

"Philippines"; 1 ♀.

37a. *Xenocerus equestris umbrinus* Jord. (1898).

Gani, Halmahera (W. Doherty); 1 ♂ and 1 ♀.

37b. *Xenocerus equestris equestris* Pasc. (1860).

Ureinuing, Aroe Islands (C. Ribbe); 2 ♂♂ and 1 ♀.

This insect and *X. olivaceus* Motsch. (1874) appear to be geographical forms of the same species. As the name *equestris* has priority, it has to be taken as the name for the entire species instead of *olivaceus*.

37c. *Xenocerus equestris senex* subsp. nov.

♂ ♀. A subspecies *X. e. equestris* dicta vitta suturali interrupta distinguendus.

Key Islands (Planten); 1 ♂ and 1 ♀.

Upperside more grey than in *X. e. equestris*. The three stripes of the pronotum practically alike in width, narrowed frontad. The basal margin of the elytra greyish white; the discal streak one-third the length of the elytra; the sutural streak narrow at the base, then interrupted for a short distance, the transverse branches somewhat angulate behind and only extending to the eighth interspace; no lateral line.

In ♂ the base of segment 4 of the antenna and the proximal half of 5 white, 10 quite black (in our only example); in ♀ the extreme tip of 7 and the whole of 8 white, as are also more or less the bases of 2 to 7, particularly 4 and 5.

37d. *Xenocerus equestris toliensis* Jord. (1898).

Toli-Toli, North Celebes, November—December 1895 (H. Fruhstorfer); 1 ♀.

37e. **Xenocerus equestris olivaceus** Motsch. (1874).

Stephansort, Astrolabe Bay, German New Guinea (Kunzmann); 1 ♂ and 1 ♀.  
Milne Bay, British New Guinea; 1 ♂.

37f. **Xenocerus equestris australicus** Jord. (1895).

Somerset, Cape York, i. 1875 (d'Albertis); 1 ♀.

38. **Xenocerus aluensis** Jord. (1895).

Shortland Islands, Solomons (C. Ribbe); 1 ♂ and 1 ♀.

39. **Xenocerus suturalis** Jord. (1904).

Jobi Island, Geelvink Bay (W. Doherty); 1 ♂ and 1 ♀.

40. **Xenocerus punctatus** Jord. (1894).

Bua-Kraeng, South Celebes, 5000 ft., February 1896 (H. Fruhstorfer); 1 ♂ and 1 ♀.

Patunuang, South Celebes, January 1896 (H. Fruhstorfer); 1 ♀.

41. **Xenocerus acosmetus** spec. nov.

♂. Niger, supra pube fulvo-olivacea, subtus grisea tectus, capite luteo-albo trivittato, pronoto et elytris haud vittatis, his macula humerali nigra, altera mediana transversa nigro-brunnea in utroque elytro, atque fascia communi postice diffusa nigro-brunnea ad apicem declivem sita notatis; pygidio vitta media sat indistincta brunneo-nigra. Antennarum articulo 3<sup>o</sup> in ♂ longo.

Long. (cap. excl.): 14 mm.

Palawan; 1 ♂.

The antenna is similar to that of *flagellatus* in the third segment being long. The species is unlike any other in pattern. The scutellum is luteous grey, as is also the basal edge of the elytra, particularly near the shoulders. The brown median spot of the elytra is diffuse in front, rounded behind, and reaches neither suture nor lateral margin; the brown transverse fascia placed at the beginning of the apical declivity is practically straight, slightly narrower than the median spot, and does not quite reach the lateral margin. The tarsal segments have black apices as usual.

42. **Xenocerus deletus** Pasc. (1860).

Banguay Is. (J. Waterstradt); 1 ♀.

Mt. Marapok, Dent Province, British North Borneo; 2 ♂♂.

Brunei, Borneo; 1 ♂ and 1 ♀.

Doesonlanden, Dutch Borneo (C. Wahnes); 1 ♂ and 1 ♀.

Bedagei, East Sumatra, 600 ft., iv.-vi. 1889 (I. Z. Kannegieter); 1 ♂.

Perak (W. Doherty); 1 ♂ and 1 ♀.



43. *Xenocerus flagellatus* Fahr. (1839).

Mt. Tjikorai and Pengalengan, West Java, 4000 ft. (H. Fruhstorfer); 7 ♂♂ and 6 ♀♀.

Southern Java, 1500 ft. (H. Fruhstorfer); 1 ♀.

Tengger Mts., East Java, 2000 ft. (H. Fruhstorfer); 1 ♀.

Tji Solak, Wynkoopsbaai (Grelak); 1 ♂.

Senggoro, Res. Pasoeroean (A. Koller); 1 ♂.

Djembea, Res. Besoeki, 1300—2500 ft. (Möllinger); 1 ♂.

The white markings of the elytra are very variable in size, shape and number. In the majority of specimens the postmedian transverse band is interrupted on each elytrum; in a large number of examples, especially ♀♀, it is complete, and in one of our ♂♂ it is reduced to a single spot situated on the suture. The discal longitudinal streak is sometimes joined to this band. The lateral line is occasionally continuous from the shoulder to the apical angle.

44. *Xenocerus semiluctuosus* Blanch. (1853).

Kairatoo, West Ceram, ii.-iii. 1892 (Martin); 2 ♂♂ and 4 ♀♀.

Illo, Ceram (C. Ribbe); 1 ♀.

Wahaai, North Ceram, iv. 1892 (Martin); 1 ♂ and 3 ♀♀.

Roemasosae-Pasania, Central Ceram, iii.-iv. 1892 (Martin); 3 ♂♂.

Saparoea, Uliassers, i. 1892 (Martin); 3 ♂♂.

Hitu, Amboina, xii. 1892 (Martin); 1 ♀.

Leitimor, Amboina, x.-xii. 1897; 5 ♂♂ and 6 ♀♀.

Boeano, iii. 1892 (Martin); 1 ♀.

In the ♂♂ from Saparoea the basal half of the elytra is white for the greater part, which is not the case to that extent in any of our examples from Ceram and Amboina.

45. *Xenocerus buruanus* Jord. (1898).

Kajeli, Boeroe, v.-vi. 1892 (Martin); 4 ♂♂ and 1 ♀.

Ilaf, Boeroe, i. (W. Doherty); 3 ♂♂ and 3 ♀♀.

Interior of Boeroe, v. 1892 (Martin); 2 ♂♂ and 1 ♀.

Tifoe Bay, South Boeroe, vi. 1892 (Martin); 1 ♂.

Waë Kibo, Boeroe, v. 1892 (Martin); 1 ♀.

The transverse postmedian band of the elytra is often produced forward at the suture, but does not reach the basal sutural streak in any of the forty odd specimens before me. The thin white lines situated in the basal half of the elytra vary in length and distinctness.

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## SOME NEW LEPIDOPTERA FROM GERMAN NEW GUINEA.

BY THE HON. WALTER ROTHSCHILD, F.R.S., PH.D.

## PAPILIONIDAE.

*Troides chimaera flavidior* subsp. nov.

♂. Differs from *T. ch. chimaera* in having the whole sides of the abdomen black instead of merely striped with black.—On the forewing the green band above vein 8 is much wider and complete to margin, the black patch between veins 3 and 4 is much larger, and there is a similar one between veins 2 and 3; below vein 1 the space is entirely green from base to tornus with only a narrow black edge.—On the hindwing the yellow is more extended; there is a triangular yellow patch in area between veins 2 and 3, and the spaces between 3 and 4 and 4 and 5 are entirely yellow, and between 5 and 6 and 6 and 7 the yellow extends beyond the black spots, which resemble a black pupil surrounded by a narrow green iris. On the underside on the forewing the green is more extended, the nervures much more narrowly black, and the discal macular band only represented by some small spots. On hindwing the yellow is extended the same as on the upper side, but the black patch between veins 1 and 2 is much larger.

*Hab.* Bolanberg, German New Guinea, 1200 m. (Keysser coll.).

I append a key to the three forms of *Troides chimaera* :

1. Sides of abdomen entirely black. 2.

Sides of abdomen not entirely black, yellow not reaching beyond black spots of hindwing . . . . . *chimaera chimaera* (British New Guinea).

2. Spots on hindwing large, green, reaching into cell, yellow much reduced: *chimaera rothschildi* (Dutch New Guinea).

3. Spots on hindwing small green, much reduced, yellow much extended: *chimaera flavidior* (German New Guinea).

## ARCTIADAE.

*Ardices novaeguineae* sp. nov.

♂. Pectus crimson; palpi black; antennae black; head and thorax chestnut buff; abdomen dirty pale crimson ringed closely with black.—Forewing chestnut buff, large intraneural stripes, a postdiscal and a subterminal band black.—Hindwing black, a postmedian band, veins 1, 2, 3 and 4, and fringe deep pink.

Length of forewing: 20 mm.

*Hab.* Bolanberg, German New Guinea, 2600 m. (Keysser coll.).

## HEPIALIDAE.

*Phassodes albostrigata* sp. nov.

♂. Head, antennae and thorax deep earth-brown; abdomen yellowish clay-colour.—Forewing earth-brown; basal half irregularly blotch, with white; within the white blotches are some small metallic yellowish spots surrounded

with grey rings; beyond the middle is a forked broad transverse white band and irregular patches of white beyond running to termen; from the middle of the wing to termen are four or five somewhat irregular rows of metallic pale yellow spots, dots and streaks edged with grey.—Hindwing yellowish earth-brown, with some indistinct dots; basal third clothed with rough yellow hair, fringe yellow.

Length of forewing : 36 mm.

*Hab.* Bolauberg, German New Guinea, 3600 m. (Keysser coll.).

## NOTES ON *IXIAS UNDATUS* BUTLER WITH THE DESCRIPTION OF THE UNKNOWN FEMALE.

BY THE HON. W. ROTHSCHILD, F.R.S., PH.D.

IN Seitz, *Die Grossschmetterlinge der Erde*, vol. ix., p. 159 (II. Abtl. Indo-australica), H. Fruhstorfer describes *undatus* Butl., placing it as a subspecies of *pyrene* Linn. In the widest acceptance of that term it perhaps would be right if we considered it as such, because it undoubtedly replaces *pyrene* in Borneo, but the discovery of the ♀ described below makes me give it full specific rank. I do this because the ♀ on the underside is quite unlike any other *Ixias*, and is in appearance a mimic of *Prioneris cornelia* Vollh.

### *Ixias undatus* Butl. ♀.

*Upperside*: Forewing creamy white, apical one-fourth black, narrowing at tornus, with white patches between veins 2 and 3, and 3 and 4, basal half of costal area pale grey, nervures from 4 to 11 black, a large black discocellular stigma.—Hindwing creamy white, a black marginal band strongly crenulated along inside edge, and the black colour running into the wings along the nervures.

*Underside*: Forewing cream-white, nervures almost entirely brownish black, costal area brownish black varied with cream-white, the very wide outer margin brownish black much broken into and variegated with white.—Hindwing, basal three-fourths golden yellow, nervures and a few scattered scales brownish black, outer one-fourth brownish black.

*Hab.* Kina Balu, North Borneo, December 1898—February 1899 (J. Waterstradt).

The ♂♂ accompanying this specimen differ from Butler's type in having the border of the hindwings much narrower. They are identical with Baram River specimens, and evidently represent the dry-season form.

ON SOME AUSTRALIAN FORMS OF *TYTO*.

BY THE HON. WALTER ROTHSCHILD AND ERNST HARTERT.

WE have both always been particularly interested in the genus *Tyto* Billb. When Hartert studied this genus in connection with his work on the birds of the palaearctic region we looked together through the material of tropical forms in the Tring Museum. Coming to the Australian ones, we found that our friend Mr. G. M. Mathews had described not less than eight new subspecies, six alone of *Tyto novaehollandiae*, which was hitherto supposed to consist of two forms only: *T. novaehollandiae novaehollandiae* and *T. novaehollandiae castanops*, the former being spread all over Australia, the latter representing it in Tasmania. As we could not make out Mr. Mathews' subspecies from our scanty material we asked him to lend us his specimens, and looked over those in the British Museum, and from our study of this material we come to the following conclusions:

I. FORMS OF *TYTO ALBA*.1. *Tyto alba alexandrae* Math.

*Nov. Zool.* xix. p. 256 (January 1912—"Northern Territory, North Queensland").

The author says that it differs from *T. a. delicatula* of Queensland, New South Wales, Victoria, and South Australia in its much smaller wing, which measures 290 mm., as opposed to 310—340 mm. in "typ. birds," by which he evidently means *T. alba delicatula*. The published measurements of Mr. Mathews must be due to an unexplainable error or slip, as the wings of a number of *T. a. delicatula* from South Australia and Victoria measure only 281—294 mm., those of his "*alexandrae*" 280—293 mm. There is not the slightest difference, either in colour or in dimensions, and "*alexandrae*" is therefore a clear synonym of *T. a. delicatula*.

II. FORMS OF *TYTO NOVAEHOLLANDIAE*.2. *Tyto novaehollandiae perplexa* Math.

*Nov. Zool.* xix. p. 257 (January 1912—"West Australia, type from East Beverley").

The diagnosis is: "Differs from *T. n. novaehollandiae* in its larger size and darker coloration." No measurements are given.

The type of *T. n. perplexa* is a female, with the wing 342 mm. It would seem that Mr. Mathews had not been aware of the fact that in *T. novaehollandiae* the sexes differ in size, the female being considerably larger, with the wings from 2 to 3 cm. longer; nor of the fact that nearly all species of the genus *Tyto* vary individually to a great extent, like so many other owls. If he had known these facts he could not have described a female as a new subspecies because its wings were 2 or 3 cm. longer, or because its upperside is a shade richer in colour than most other specimens of what he then considered to be *T. novaehollandiae*, in January 1912. If he splits the species up into seven or eight forms, as he did in April 1912, his *perplexa* would in any case be the same as his *kimberli* and *whitei*,

### 3. *Tyto novaehollandiae kimberli* Math.

*Nov. Zool.* xix. p. 257 (April 1912—"North-west Australia." Terra typica: East Kimberley).

Diagnosis: "Differs from *T. n. novaehollandiae* in its much paler coloration and smaller size." Measurements not given.

There was no justification for the separation of this supposed "*kimberli*" in January 1912. The type is not smaller than males of what the author called *novaehollandiae* from other localities at that time, and the somewhat pale colour loses all significance if only one glance is cast on a pair from the South Alligator River in the Tring Museum, which differ from each other much more than the type of "*kimberli*" does from other specimens. *T. n. kimberli* must therefore be united with *whitei* and *perplexa*.

### 4. *Tyto novaehollandiae mackayi* Math.

*Austral Avian Record* i, 2, p. 34 (April 1912—"Queensland." Terra typica: Mackay).

Diagnosis: "Differs from *T. n. novaehollandiae* in having the facial disc white, with the feathers round the eye chocolate at the base; it is lighter above, and lacks the buff on the lower surface. Wing 515 mm."

The diagnosis is not elucidating, as the supposed differences of *T. n. novae-hollandiae* alone are given, which Mr. Mathews does not characterize, and of which, since he now separates the South Australian and Victorian forms, there is no skin in his collection, as it must be restricted to New South Wales, according to his recent views. All Queensland, North-West Australian, and West Australian skins before us have similar white facial discs! In fact, "*mackayi*" is perfectly similar to "*kimberli*" and "*whitei*."

### 5. *Tyto novaehollandiae whitei* Math.

*Austral Avian Record*, i, 2, p. 34 (April 1912—"South Australia." Type: Adelaide).

Diagnosis: "Differs from *T. n. mackayi* in its darker upper-surface and smaller size: wing, 301 mm."

This diagnosis—emphasizing a trivial difference in the colour of the upper-side—clearly shows that Mr. Mathews was not aware of the great individual variations exhibited in most forms of the genus *Tyto*, and the difference in size is irrelevant; we measure the wing 307 mm. There is no appreciable difference between "*whitei*," "*mackayi*," "*kimberli*," and "*perplexa*."

We may call attention to the fact that Gould (*B. Australia* i.) says that he never shot a "white" specimen in South Australia, while the type of "*whitei*" has the underside quite white. The supposed *whitei* can therefore not be separated from *kimberli*, *perplexa*, etc.

### 6. *Tyto novaehollandiae riordani* Math.

*Austral Avian Record*, i, 2, p. 35 (April 1912—"Victoria." Type: "Warnambool").

Diagnosis: "Differs from all other subspecies of *T. novaehollandiae* in its darker upper-surface and larger-sized wing, 343 mm."

We cannot agree with these statements: the upper-side of the type of "*riordani*" is to our eyes a shade **less** deep than in the type of *perplexa*, and the

wing (which we measure 351 mm.) is only 9 mm. longer than in the latter; moreover, the author evidently forgot to think of *castanops*, which is also a subspecies of *novae-hollandiae*. Worst of all, he does not state the differences from *T. novae-hollandiae novae-hollandiae*; for the latter he fixed the type locality as New South Wales, which seems to belong to the same faunal region as Victoria. Probably Mr. Mathews regards as "typical" *novae-hollandiae* a large form with brownish face and brownish underside, inhabiting New South Wales only. If that be so, his *riordani* would probably be the same, as one of his two specimens (a young bird) is brown underneath, the other almost pure white. If we take this view, and presume that the birds from Queensland, West Australia, and North-west, as well as those from South Australia, are always white or nearly white below, the latter could be separated under Mr. Mathews' first name: *perplexa*.

### 7. *Tyto novae-hollandiae melvillensis* Math.

*Austral Avian Record*, i. 2, p. 35 (April 1912—Melville Island).

Diagnosis: "Differs from *T. n. perplexa* in its smaller size and darker buff below." Measurements not given.

Mr. Mathews possesses two specimens, both marked "♀"; one is apparently adult, another, unfortunately marked as the type, is a young bird with remains of down. The adult "♀" has a wing of 390 mm., which would be small for a female, but is it correctly sexed? This bird is **not** darker buff below than "*perplexa*." The other specimen is underneath darker buff than "*perplexa*"; its wing measures over 320 mm., but cannot be relied upon, as it is a young bird. Both have the **upper** surface a shade darker than the other owls of this species from Australia. It is therefore **possible**, but—considering the variation of Barn-owls—needs to be confirmed by a better series, that the Melville owl differs slightly and will have to be called *melvillensis*. The material on which Mr. Mathews based his new subspecies would not have been sufficient for us to separate it.

All which a study of these forms admits of being done at present is to assume—

- (A) *T. n. novae-hollandiae*, a larger and (underneath) darker form from Victoria and New South Wales (synonym *riordani*), to be confirmed by a series!
- (B) *T. novae-hollandiae perplexa* from the rest of Australia (underneath never brownish? and averaging smaller, synonyms *kimberli*, *mackayi*, *whitei*).
- (C) *T. novae-hollandiae melvillensis* from Melville Island—a doubtful form which rests on one adult—apparently wrongly sexed—and one juvenile specimen, and which requires further confirmation!

Besides these birds we have, in the Tring Museum, two remarkable specimens of the species *T. novae-hollandiae*. One is a skin purchased from a dealer in London, without locality, but probably from New South Wales. It is above of a bright yellowish orange-buff, with less extended black markings than usually, and the white ones rather more extended. Underside pale yellowish buff, whitish in the middle of the abdomen and belly. Spots on underside large, flanks with arrow-head-shaped blackish spots. It is a young bird in its first full plumage, and, judging from the size of the feet and bill, a female. We can, of course, not say if this one specimen is a variety of *T. n. novae-hollandiae*, which we believe it is, or a local form from an uncertain locality. There is a somewhat similar example in the British Museum.

The other curious specimen is an adult male from Cape York, collected by Mr. A. S. Meek on August 4, 1898. The upper surface is entirely black and white, without all yellowish or rufous colour, the underside pure silky-white with only very few tiny blackish spots. Wing, 286 mm. This is most likely a new race, but we do not venture to separate it on the evidence of one single bird!

Last of all we come to

### **Tyto novaehollandiae castanops**

from Tasmania.

This subspecies is supposed to be very distinct, so that it was even kept separate by Sharpe in 1875 (*Cat. B. Brit. Mus.* ii. p. 305), who had, a few pages before, united *T. a. "flammea"* (auct.) from Central Europe, *T. a. alba* from the Mediterranean, *insularis*, *poensis*, *indica*, *delicatula*, *pratincola* (!), *furcata* (!), *punctatissima*, etc. etc. etc. We quite agree that *castanops* must be separated as a subspecies on account of the generally more orange-buff upperside, generally dark brownish underside, brown facial disc, and averaging larger size. There are, however, specimens with the upperside quite as in typical *novaehollandiae*, while others have the underside almost whitish, and the facial disc much lighter. Wings, ♂ 318 or 320, ♀ 350—370 mm.

### III. FORMS OF *TYTO TENEBRICOsa*.

#### 1. **Tyto tenebricosa tenebricosa**

has been restricted to New South Wales by Mr. Mathews.

#### 2. **Tyto tenebricosa multipunctata** Mathews.

*Nov. Zool.* xix. p. 255 (January 1912—North Queensland, type locality: Johnston River).

Diagnosis: "Differs from *T. t. tenebricosa* in its smaller size, and more spotting above and below. Wing, 263 mm.; typ. w. 290 mm."

This is, judging from the material available—*i.e.* the type in Mr. Mathews' collection and two males from Cedar Bay in North Queensland—collected by Mr. A. S. Meek, in the Tring Museum, an excellent new form. We measure the type with a wing of 265, and our two males from Cedar Bay with wings of 240 and 242 mm. We believe, however, that the type is wrongly sexed, being a female, not a male. The upperside is ornamented with much **larger** white spots and more distinctly mottled with whitish.

#### 3. **Tyto tenebricosa magna** Mathews.

*Nov. Zool.* xix. p. 258 (January 1912—"Victoria").

Diagnosis: "Differs from *T. t. tenebricosa* in its larger size, darker coloration, and less spotting. Wing, 343 mm.; typ. w. 290."

We are sorry to say that Mr. Mathews has described the female as a new subspecies from comparison with males. Had he cast one glance at our series of *Tyto tenebricosa arfaki* from British New Guinea, or looked up statements of writers on Australian birds, he would have found that the sexes differ enormously in size in these birds. In our *T. t. arfaki*, for example, we find males with wings of 255, and females from the same place with wings of 300 mm. Moreover, the

statement that the type of *Tyto tenebricosa magna* is darker and less spotted is incorrect, as far as the specimens before us are concerned. It is thus clear that "*magna*" is a sure synonym of *tenebricosa*, and we can at present only admit :

*Tyto tenebricosa tenebricosa* : Australia (New S. Wales!).

*Tyto tenebricosa multipunctata* : North Queensland.

*Tyto tenebricosa arfaki* : New Guinea.

With regard to the much ventilated question of the generic names of the genus, we can only repeat what Mr. Mathews has said—*i.e.* that *Tyto* is its oldest name. Some authors would, however, reject it, on account of *Tyta*, a generic title established by the same author (Billberg) some years previously. Under the existing rules we cannot justify the rejection of *Tyto*, which is distinguishable in orthography and by ear from *Tyta*, and which was most probably made by Billberg in order to distinguish it from his *Tyta*, but should it be arbitrarily rejected, the name *Flammea* Fournel (1836), and not "*Hybris*," would have to be employed.

## DER WANDERFALKE UND DIE LEMMINGZÜGE.

VON BENGT BERG.

DER früheste Eindruck, dessen ich mich im Zusammenhang mit dem Begriff Lemmingwanderung erinnere, ist eine Abbildung in Brehms "Vom Nordpol zum Equator," schwedische Auflage. Das Bild stellt einen Lemmingzug dar, worin die Lemminge nach der üblichen Illustratorenfassung als ein dichtes Heer vorwärtsgehen, so dicht, dass es für die meisten Individuen ausgeschlossen erscheint, Nahrung zu suchen.

Während der vier Lemmingjahre, in denen ich im nördlichen Skandinavien Gelegenheit gehabt habe, die kleinen wandernden Nagetiere zu beobachten, ist es mir nie vergönnt gewesen, sie auf diese Weise, in dicht geschlossener Schar vorwärtsziehen zu sehen, und ich wage zu bezweifeln, dass sie es tun, mit Ausnahme derjenigen Fälle, wo eine besonders schwer überwindliche Oertlichkeit sie dazu zwingen könnte. Meine Erfahrung hat gelehrt, dass bei den Wanderungen der Lemminge selten mehr als einige Stücke in Gesellschaft auftreten. Meist sind sie, einer hier, einer da, über die Hochebenen und Waldungen verstreut. Dagegen kann man buchstäblich sagen, dass sich da in jedem Strauche einer findet.

Doch dies betraf nicht den ornithologischen Fehlgriff, den die Illustration bei Brehm zeigte. Dieser besteht seinerseits in der wohlbekanntem Tatsache, dass da ein *Falco peregrinus* zu sehen ist: ein alter Vogel, mit einem offenbar soeben gefangenen Lemming in den Krallen.

Es ist nun sicherlich nicht meine Absicht, hier einen vereinzelt Missgriff in dem Werke eines berühmten Autors zu kritisieren. Es ist auf der einen Seite nicht ausgeschlossen, wenn auch kaum glaublich, dass ein Wanderfalken einen Lemming aus der Menge, die sich unter ihm bewegte, nehmen könnte, aber andererseits darf man es als wenig glücklich gewählt ansehen, dass ein Edelfalken, der in der Regel nur fliegende Beute ergreift, in einer beherrschenden Arbeit in einer solchen Situation dargestellt wird. Indes hat der Urheber des Bildes oder des Textes sicherlich



gewusst, dass der Wanderfalke während der Lemmingjahre in grosser Zahl innerhalb der lemmingreichen Gegenden vorkommt. Es geschieht oft, dass dieser Vogel, der doch in der Regel Felsennister ist, um das Lemminggebiet der Tundren bewohnen zu können, sich damit begnügt, seine Eier auf die flache Hochebene zu legen.

Wenn es also auch nicht seine Gewohnheit ist, aus dem Ueberfluss von Nagern zu nehmen, mit denen seine Anwesenheit doch offenbar im Zusammenhang steht, so fragt man sich mit Recht: Warum ist er da? Was sucht er, und wovon ernährt er sich?

Und die Wahrnehmungen, die ich zu machen Gelegenheit hatte, heissen mich ohne Bedenken antworten: Der Wanderfalke kommt nicht, um sich von den Lemmingen zu ernähren, sondern um sich den Ueberfluss von Vögeln, vor allem Sumpfhöhren, zunutze zu machen, die ihrerseits unmittelbar der Lemminge wegen kommen.

Ich weiss nicht, ob jemals eine Erfahrung über diesen Fall veröffentlicht worden ist. Es ist mir nicht vergönnt, alle Literatur auf diesem Gebiet durchlesen zu können; jedenfalls ist mir nichts, was meine Beobachtung deckt, vor Augen gekommen.

In vier verschiedenen Fällen habe ich Gelegenheit gehabt zu konstatieren, dass *Falco peregrinus* während eines Lemmingjahres innerhalb des Nagergebiets sich von *Asio flammeus* (= *Otus brachyotus* auct.) ernährt. Alle diese Fälle fallen in das Jahr 1911; und dass ich nicht auch während mehrerer vorhergehenden Jahre eine ähnliche Erfahrung gemacht habe, das hat seinen Grund darin, dass ich damals während der Lemmingjahre zufällig nicht diejenigen Gegenden besuchte, wo ich in Berührung mit dem Wanderfalken kam. Seine Verbreitung im nördlichen Skandinavien ist sehr sporadisch.

Im Mai 1911, in der Nacht zwischen dem siebten und achten, war ich auf einer mehrere Meilen weiten Skifahrt unterwegs, um im Neste die Eier eines Goldadlers zu photographieren, der so dunkelrot gefleckte Eier legt wie kein anderer mir bekannter Goldadler. In der Gegend waren Raubvögel in Hülle und Fülle. Es gelang mir bei derselben Gelegenheit, ein altes Habichtweibchen im Nest gut zu photographieren—ich vergalt Frau Habicht ihre Gefälligkeit damit, dass ich weder sie noch ihre Eier wegnahm. Aber nicht genug damit. Nachdem ich nach vieler Mühsal das Goldadlernest erreicht hatte, wo natürlich kein Adler zu Hause war, und nachdem ich oben auf dem Baume gewesen war, photographiert und die hübschen Eier an mich genommen hatte, hörte ich auf dem Rückweg ein paar Wanderfalken schreien. Da ich vermutete, dass sie vielleicht des Adlers wegen schrien, und da ich gerne den Vogel sehen wollte, der so schöne Eier legte, schlich ich waldaufwärts, so gut es sich auf Schneeschuhen schleichen liess. Einen der Falken sah ich oben unter einer steilen Felswand jenseits der Waldwipfel. Als der Wald sich nach dem Höhe hin lichtete, sah ich auch den andern; der erste war das Männchen gewesen; und ich war verwundert darüber, dass sie so hoch oben wohnten. Wenn ich mich recht erinnere, wuchs keine Birke über ihnen. Wenn ich sage, sie wohnten, so meine ich, dass sie zu wohnen beabsichtigten, denn zu dieser Zeit, Anfang Mai, hat der Wanderfalke in Lappmarken noch nicht daran gedacht, sein Nest in Ordnung zu bringen, sondern hält sich bloss als Räuber in der Gegend auf. Ein Adler war nicht zu erblicken, doch plötzlich wurde meine Verwunderung durch eine Menge Federn der Sumpfhöhre geweckt, die unterhalb der Felswand auf dem Schnee verstreut lagen um einen

einzelnen hohen Stein herum. Ich entdeckte sofort, dass auch oben auf dem beschneiten Rande des Steines Ueberreste der Eule lagen, aber der Stein war hoch und steil, und ich war müde und hatte die Schneeschuhe an den Füßen. So begnügte ich mich denn damit, verwundert zu konstatieren, dass hier eine frisch zerpfückte Sumpfohreule lag, und dass ein anderer als einer der anwesenden Wanderfalken schwerlich der Mörder sein konnte. Warum die Vögel bei dieser Gelegenheit schrien und zornig waren, so lange Zeit bevor sie Eier legten, ist mir nie klar geworden. Möglich ist es ja, dass der in der Nähe wohnende Adler, von mir unbemerkt, unmittelbar vorher vorübergestrichen war, und dass einer der Falken in Erregung darüber geriet, dass er bei seiner Beute gestört wurde. Sonst pflegen alte Edelfalken bei einem Raub meist zu schweigen.

Ein paar Wochen später lag ich draussen auf einem Moorgelände in derselben Gegend, um einige Wasserläufer (*Totanus fuscus*) zu beobachten, die soeben auf dem Brutplatze eingetroffen waren. Drüben über dem Moor und dem niedrigen Birkenwald flogen mehrere Sumpfohreulen hin, fünf oder sechs Stück, in der für sie charakteristischen Weise: hin und her, vermutlich um die kleinen Nagetiere (*Arvicola rutilus* und *rufocanus*) aufzusuchen, die als Vorboten einer Lemmingwanderung in diesen Gegenden häufig vorzukommen pflegen. Während ich still dalag, in ein Zwergbirkengebüsch gedrückt, kamen die Eulen immer näher, einander in einer Höhe von zehn Metern mit den ihnen eigentümlichen langen, hebenden Flügelschlägen umkreisend. Ich vergass darüber meine Wasserläufer vollständig. Es war früh am Morgen, aber die Sonne ging bereits um ein Uhr nachts auf, so dass volles Tageslicht herrschte.

Als die Eulen nun mit jedem Augenblick näher und näher kreisten, tauchten sie alle plötzlich wie auf ein gegebenes Zeichen auf die ebene Erde unter und waren für mich verschwunden, und zugleich erblickte ich einen Wanderfalken, der mit gewohnter Eile über dem Moor herangejagt kam. Er kam direkt auf mich zu, hielt flatternd einen Augenblick über der Stelle inne, wo die Eulen eingefallen waren, erhob sich ein Stück und hielt von neuem inne, wie ein Turmfalke flatternd. Dann wurde er wahrscheinlich der Sache überdrüssig und flog in bestimmter Richtung von dannen.

Ich wartete, dass er vielleicht zurückkommen würde; es war mir jetzt ganz klar geworden, dass sein Interesse mit den Eulen verknüpft war, aber er erschien vorläufig nicht wieder. Wohl eine Viertelstunde lag ich still in meinem Gebüsch und bekam keine Eule zu sehen. Da dauerte mir die Geschichte zu lange, und ich stand auf. Die Eulen, wenigstens einige, mussten sich bloss einen Steinwurf von mir entfernt niedergelassen haben; aber obgleich ich nun aufrecht stand und in der Nähe in dem Moor nur niedriges Buschwerk wuchs, flog keine Eule auf. Da ich nichts mehr an Ort und Stelle zu tun hatte, nahm ich meine Kamera und ging auf das Lager zu. Da flog, als ich einige Schritte weit gegangen war, eine Sumpfohreule vor mir auf. Gleich danach noch eine, ganz dicht neben meinen Füßen, wo sie auf dem flachen Moorboden gekauert hatte. Keine von ihnen flog weit—bloss etwa hundert Meter. Dort warfen sie sich wieder zu Boden auf dieselbe Art, wie sie es zu tun pflegen, wenn man sie im Herbst auf den Strandwiesen am Meere trifft. Offenbar sass der Schreck vor dem Wanderfalken noch in ihnen. Ihr Verhalten ist dem von Rehbühnern vollkommen analog, denen bei der Jagd unvermutet von einem Habicht nachgestellt wird.

Wenn nun die Sumpfohreulen selbst so stark auf die Anwesenheit des

Wanderfalken reagieren, so halte ich das für den handgreiflichsten Beweis dafür, dass sie in ihm einen regelmässigen gefährlichen Feind sehen.

Einen Tag darauf kam ein lappländischer Hirte zu mir mit einer Sumpfohreule, die er nach seiner eignen Aussage einem "Stuor Habak" weggenommen, der die Eule unmittelbar vor den Augen des Hirten geschlagen und sich dann mit ihr in einiger Entfernung niedergelassen habe. Nun bedeutet "Stuor Habak" allerdings auf Tornelappländisch "Gerfalk," also "*Falco gyrfalco*," aber da ich meine Freunde, die Lappen, kenne, weiss ich, dass sie keinen besondern Namen für den Wanderfalken haben, den sie im Winter nicht zu sehen bekommen, sondern ihn in der Regel mit demselben Namen wie den Jagdfalken (Gerfalken) benennen. Es kommt hinzu, dass in dem fraglichen Gelände keine Jagdfalken vorzukommen pflegten, wohl aber Wanderfalken, die in der Nähe brüteten. Ich habe auch bei mehreren Jagdfalkennestern, die ich untersuchte, niemals Federn von Sumpfohreulen, sondern fast nur von Schneehühnern gefunden.

In dem vierten Fall, wo ich beobachtete, dass der Wanderfalke Sumpfohreulen fängt, erhielt ich den untrüglichen Beweis dafür, dass der Falke diesem Vogel nicht nur in grossem Massstabe nachstellt, sondern dass die Eule sogar als die hauptsächliche Nahrung des Wanderfalken angesehen werden kann.

Es war Mitte Juni, als ich von einem Ansiedler auf eine Waldhöhe geführt wurde, auf der seiner Behauptung nach ein "Habicht" an der Felswand sein Nest habe. Natürlich wusste ich sofort, was für ein "Habicht" das war, da der Hühner-Habicht bloss auf Bäumen nistet. Als ich den Ansiedler fragte, wie der Vogel schreie, begann er sofort ihn nachzuahmen, und damit war der Wanderfalke identifiziert. Der Jagdfalke, der in gewissen Altersgraden ebenso wie der Wanderfalke schreit, kam in der Gegend nicht brütend vor; das wusste ich bestimmt.

Ich stieg nun meine Anhöhe hinauf und suchte mir einen Weg durch den Wald hindurch nach der Seite hin, wo die steilen Abhänge zu finden sein sollten. Ich fand sie auch; es war eine kilometerlange, zwischen 20 und 30 Metern hohe, jäh abfallende Felswand auf einen See hinaus; und als ich auf einen Felsvorsprung trat, um von dort aus zu versuchen, die Lage des Falkennestes zu entdecken, was fand ich auf dem äussersten Felsenrande? Federn und Ueberreste einer Sumpfohreule.

Von einem Wanderfalken erblickte ich noch nichts, aber in demselben Augenblick, als ich die zerpfückte Erdele sah, wusste ich ja, dass er nicht weit entfernt sein konnte. Zugleich verblüffte es mich, dass der Falke seine Eulen so weit hierher trug. In der nächsten Umgebung war nämlich ein tiefer Waldsee und darum herum hoher Nadelwald auf dürrern, felsigem Grunde, und die nächste Stelle, wo eine Erdeule nisten konnte, lag mehrere Kilometer weit. Bei näherer Kenntnis der Gegend fand ich, dass die Falken mehrere ihrer Eulen aus einer Entfernung von über zehn Kilometern holen mussten. Sie hatten nämlich mehrere. Während ich an dem Abhang entlang vorwärts ging, fand ich auf den Absätzen sechs Stück, d. h. natürlich bloss einen Haufen ausgerissener Federn und einen Flügel oder Fuss; und ich bin überzeugt, dass weiter abwärts an der Felsenwand, wohin ich nicht gelangen konnte, noch mehr lagen. Das Ganze erinnerte mich vollkommen an die Art des Jagdfalken, alle Absätze und Vorsprünge der Felsenwand dort, wo er sein Nest hat, mit Schneehühnern zu garnieren. Hier nun waren es lauter Sumpfohreulen. Ich sah keine einzige Feder von einem andern Vogel, bevor ich das Nest fand.

Es dauerte recht lange, bis ich letzteres fand. Als ich keinen Vogel sah, las ich faustgrosse Steine auf und liess sie gegen den Abhang prallen, wo es zweckmässig zu sein schien. (Wenn ein allzu sentimentaler Tierschutzapostel mir vorwerfen wollte, dass ich mit solchen Steinwürfen die Vögel oder das Nest zu treffen riskierte, möchte ich bloss einwenden, dass die Aussichten für die Vögel, in dem Nest getroffen zu werden, ungefähr ebenso gross waren wie meine Chancen, ein Meteor auf den Kopf zu bekommen, wenn ich eine Sternschnuppe betrachte.) Das Manöver mit den Steinen gelang mir schliesslich doch. Das Wanderfalkenweibchen flog plötzlich, von dem Getöse aufgeschreckt, aus einer Felsspalte unter mir auf.

Zuerst wusste ich mir keinen Rat, wie ich zu dem Nest hinabgelangen konnte, aber nach langem Suchen und dadurch, dass ich auf der Seite der Felswand ein Stück abwärts ging, gelang es mir, einen Absatz zu finden, der zu dem Neste führte. Da lagen vier Eier und die Ueberreste von zwei Sumpfohreulen. Ausserdem Federn von einem *Totanus glareola* und von zwei, vielleicht drei Pfeifenten. Aber die Ueberreste dieser letzteren hatten sehr lange gelegen und rührten möglicherweise aus einer Periode des Frühlings her, da noch keine Erdeulen am Platze zu finden waren. Es ist zu bemerken, dass keiner dieser Raubüberreste im Neste selbst lag, das bloss eine seichte Vertiefung mit einigen losen Blöcken darum war, sondern einzeln ringsum auf Absätzen und Felsenrändern.

An dieser Stelle fand ich also nicht weniger als acht Sumpfohreulen; und dies in Verbindung mit dem vorher Angeführten bietet nach meiner Ansicht eine ausreichende Erklärung für die örtliche Vermehrung und Anwesenheit des Wanderfalken in Gebieten, wo Lemmingwanderungen stattfinden. Ich habe es für unnötig gehalten, vorher zu erklären, dass die Sumpfohreule völlig abhängig ist von der Nagetiervermehrung in den Lemmingjahren, und dass sie während der andern Jahre in den betreffenden Gegenden sehr selten ist. Gelegentlich werde ich an andrer Stelle auf diese letztere Frage und auf eine Erörterung der Lemmingwanderungen im allgemeinen, sowie den mit ihnen verbundenen Stammesverschiebungen der Fauna zurückkommen.

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ORNITHOLOGISCHE MISZELLEN AUS DEM  
INDO-AUSTRALISCHEN GEBIET.

VON ERWIN STRESEMANN.

II. THEIL.\*

XIX. Die Formen von *Artamus leucorhynchus* (L.).

Übersicht.

A. Oberkopf, Kehle und Kropf schwärzlich grau oder russfarben mit geringer grauer Tönung :

a. Rücken in der Regel mit ausgesprochen bräunlichem Ton : Schnabel lang und relativ schlank ; durchschnittliche Flügellänge etwa 135 mm.

*A. l. leucorhynchus.*

b. Rücken in der Regel mit sehr geringem bräunlichem Ton ; die Oberseite ist in folgedessen nahezu einfarbig ; Schnabel lang und an der Basis relativ hoch ; durchschnittliche Flügellänge etwa 135 mm.

*A. l. musschenbroeki.*

B. Oberkopf, Kehle und Kropf dunkel schieferfarben, meist wesentlich heller als bei der Gruppe A :

a. Schnabel lang und schlank, Flügel, meist über 135 mm. *A. l. celebensis.*

b. Schnabel relativ kurz, Flügel stets unter 135 mm. *A. l. humei.*

C. Oberkopf, Kehle und Kropf in der Regel heller als bei der Gruppe A und dunkler als bei der Gruppe B :

a. Schnabel relativ kurz, von der gleichen Gestalt wie bei *A. l. humei*, Flügellänge im Durchschnitt etwa 129 mm. *A. l. leucopygialis.*

b. Schnabel länger, Flügel in der Regel über 129 mm. *A. l. papuensis.*

D. Oberkopf, Kehle und Kropf russschwarz, gewöhnlich ohne graue Tönung :

a. Rücken in der Regel mit ausgesprochen bräunlicher Tönung

*A. l. melaleucus.*

b. Rücken in der Regel schwärzlich ohne deutlich hervortretende braune Tönung . . . . . *A. l. peleuensis.*

Zeichenerklärung.

Es bedeuten :

Massangaben ohne Zusatz : Exempl. des Tring-Museums.

„ mit einem \* : „ des British Museum.

„ mit einem † : „ der Collection G. M. Mathews.

P = nach Parrot, Beiträge zur Ornithologie Sumatras, in *Abh. K. Bayer. Akad. d. Wiss.* ii. Kl. vol. xxiv. p. 228.

M = nach A. B. Meyer, *Zeitschr. Ges. Orn.* vol. 3 pp. 19, 20.

F = nach Finsch, *Not. Leyd. Mus.* vol. 26 p. 67.

V = nach Vorderman, *Nat. Tijdschr. Ned. Ind.* vol. 52 p. 193.

B = nach Brüggemann, *Abh. Nat. Ver. Bremen* vol. 5 p. 69.

\* I. Teil : *Nov. Zool.* vol. xix. pp. 311-51.

## 1. *Artamus leucorhynchos leucorhynchos* (L.)

*Lanius leucorjy*. Linnaeus, *Mantissa* p. 524 (1771—Manilla).

*Lanius philippinus* Scopoli, *Delic. Flor. et Faun. Insubr.* vol. ii p. 85 (1785—Philippinen).

*Lanius leucorhynchos* Gmelin, *Syst. Nat.* vol. i p. 305 (1788—Manilla).

*Lanius dominicianus* Gmelin, *Syst. Nat.* vol. i p. 307 (1788—Philippinen).

*Ocypterus leucogaster* Valenciennes, *Mém. Mus. d'Hist. Nat.* vol. vi p. 21 t. vii f. 2 (1820—nom. nov. pro *Lanius leucorhynchos* Gmelin).

In *Not. Leyd. Mus.* 1910 p. 152 citiert van Oort nicht Linné, sondern Gmelin als Autoren des Namens *leucorhynchos* mit der Begründung, dass die Bezeichnung in der *Mantissa Plantarum* nicht ausgeschrieben wurde. Verwirft man indessen den Linnéschen Namen, so hat Scopoli's *Lanius philippinus*, womit zweifellos die vorliegende Form gemeint ist, vor Gmelin's *Lanius leucorhynchos* die Priorität.

Exemplare von den Sulu-Inseln scheinen mit solchen von den Philippinen übereinzustimmen; dagegen muss die Identität der letzteren mit Borneo- und Bunguran-Stücken noch an der Hand grösserer Serien erwiesen werden. Nach den im Tring-Museum befindlichen 4 Exemplaren vom Natuna-Archipel hat es den Anschein, als sei diese Inselgruppe von einer eigenen Form bewohnt, die sich durch wesentlich schwärzlicheren, weniger bräunlichen Rücken von der typischen unterscheidet. Doch finden sich gleichgefärbte Exemplare auch gelegentlich unter Philippinenvögeln.

Flügelänge in mm.:

Philippinen: 130\*, 131\*, 132, 132, 132, 132, 132, 132\*, 132\*, 132\*, 133, 133, 133\*, 134, 134, 134\*, 134\*, 134\*, 134\*, 134\*, 134\*, 134\*, 134\*, 135, 135\*, 135\*, 135\*, 135\*, 135\*, 135\*, 135\*, 135\*, 136, 136\*, 136\*, 136\*, 136\*, 136\*, 136\*, 136\*, 136\*, 136\*, 137, 137, 137\*, 138, 138, 138, 140\*, 141, 142\*—Durchschnitt von 50 Ex.: 134.9 mm.

Sulu-Archipel: 134, 134, 136, 136\*, 138, 138.

Borneo: 132\*, 133, 136, 136\*, 138 [M].

[11 Ex. nach F.: 132—141].

Bunguran: 138.

Sirhassen: \*138.

Verbreitung: Philippinen, Palawan, Sulu-Archipel, Borneo (?), Natuna-Archipel (?).

## 2. *Artamus leucorhynchos celebensis* Brüggem.

*Artamus leucorhynchos*, var. *celebensis* Brüggemann, *Abh. Nat. Ver. Bremen* vol. v p. 69 (1876—Celebes).

Die geographische Begrenzung dieser Form ist zur Zeit noch unsicher. Ihre typischste Ausbildung scheint sie in Nord-Celebes zu erreichen, doch dürfen offenbar auch die Vögel von Buton, Djampea und den Inseln zwischen Sumbawa und Flores hierzu gerechnet werden. Auffallend ist die Kurzflügigkeit der bisher gemessenen Saleyer-Stücke, die eine Parallele zu dem Befund bei *Pratincola caprata albonotata* Stres. bildet (cf. *Nox. Zool.* vol. xix p. 322), und es ist nicht unwahrscheinlich, dass diese Insel eine ihr eigentümliche Form beherbergt. Bei Exemplaren von Alor, Wetter und Timor sind die grauen Töne etwas dunkler als bei solchen von den übrigen Inseln; sie vermitteln offenbar den Übergang zur Form *A. l. musschenbroeki*, stehen aber *A. l. celebensis* etwas näher.

Flügelänge in mm.:

Nord-Celebes: 140, 140, 142\*, 143, 144\*, 144\*, 146\* [M: 135—145].

Süd-Celebes : 135\* [M : 135—136].

“ Celebes ” : 13 Ex. nach F : 132—145 ; 30 Ex. nach B : 136—146.

Buton : 137, 140.

Saleyser : 128 [F], 131, 136.

Djampea : 140.

Sumbawa : 138, 139, 141, 142.

Lombok : 133\*, 133\*, 134, 134\*, 136\*, 139, 143 [F].

Kangean : 137 [V].

Flores : 135, 138\*, 139, 140\*.

Sumba : 140, 146 [M : 135—140].

Alor : 138, 140.

Wetter : 134, 135, 135, 135, 135 [M], 136.

Timor : 129, 132\*, 135, 136\*, 137\*.

### 3. *Artamus leucorhynchos musschenbroeki* A.B.M.

*Artamus musschenbroeki* A. B. Meyer, *Sitzber. u. Abh. Nat. Ges. Isis.* 1884 p. 30 (Tenimber und Timorlaut).

Exemplare von Babbar stimmen vollkommen mit solchen aus Tenimber überein ; sie wurden von Hartert in *Nov. Zool.* 1906 p. 302 versehentlich als *Artamus leucorhynchos* aufgeführt.

Flügelänge in mm. :

Tenimber : 130, 132, 132, 132\*, 134, 135\*, 136\*, 138, 138\* 140\* [M : 130—140]

Babbar : 133, 135, 135, 137.

*Verbreitung* : Tenimber-Inseln, Babbar.

### 4. *Artamus leucorhynchos humei* subsp. n.

In strukturellen Merkmalen steht diese Form, die auf die Andamanen beschränkt ist, der australischen am nächsten, während sie in der Kopffärbung mit *A. l. celebensis* am besten übereinstimmt, meist sogar hier noch etwas heller ist. Hume hat sie bereits mit Australiern verglichen und bemerkt in *Stray Feathers* vol. ii, 1874, p. 214 : “ It appears to me that in the Andaman birds the head and back, but especially the former, are far more slaty, while in the Australian they are more sooty [doch kommen in Australien gelegentlich ebenso hell gefärbte Stücke vor, unter 70 Ex. etwa 4] ; and again, that the bill in the former is slightly more compressed and narrower, especially towards the base, than in the latter.”

Flügelänge in mm. :

127, 129, 132, 132\*, 132\*, 133, 133, 133, 134\* [F : 3 Ex. : 126—130].

*Typus* : ♀ Süd-Andaman, x. 1897, A. L. Butler coll., im Tring-Museum.

*Verbreitung* : Andamanen, einschliesslich der Grossen und Kleinen Kokos-Insel.

### 5. *Artamus leucorhynchos* subsp. ?

Die von mir untersuchten Stücke von Sumatra, Java und Bali lassen sich nicht zwanglos unter eine der oben aufgeführten Formen einreihen ; die Färbung von Oberkopf, Kehle und Kropf ist bei ihnen in der Regel heller als bei Philippinestücken, dunkler als bei *celebensis*. Sie stimmen auch unter sich nicht

überein, indem Sumatraner im Durchschnitt beträchtlich grösser zu sein scheinen als Javaner und Balier.

Flügelänge in mm. :

Sumatra : 128 [F], 135\*, 136 [P], 137\*, 138\*, 139, 140 [F], 141\*, 141\*.

[M : 135—140].

Java : 129 [P], 129 [P], 132 [P], 133\*, 133\*, 134 [14 Ex. nach F : 126—138].

Bali : 132, 134, 135\*.

## 6. *Artamus leucorhynchus leucopygialis* Gould.

*Artamus leucopygialis* Gould, *P. Z. S.* 1842 p. 17—Australien.

*Artamus leucorhynchus parvirostris* Hartert, *Nor. Zool.* vol. vi p. 424 (1899—Kap York).

*Artamus leucorhynchus harterti* Mathews, *Nor. Zool.* vol. xviii p. 367 (1912—Nordwest-Australien).

*Artamus leucorhynchus melvillensis* Mathews, *Austr. Av. Rec.* vol. i No. 2 p. 45 (1912—Melville Island).

Diese Form scheint für einige Gegenden Australiens Zugvogel zu sein (cf. North, *Nests and Eggs of Birds* etc., ii. p. 252), und es sind möglicherweise die in Südost-Neuguinea gefundenen Stücke, die sich durch ihre beträchtliche Kleinschnäbligkeit als dieser Form angehörig zu erkennen geben, dortselbst nicht heimisch. Dagegen scheinen die Molukken nicht von australischen Zugvögeln berührt zu werden. Eine sichere Entscheidung ist freilich zur Zeit nicht möglich, da der Schnabel der australischen Form häufig die bei *papuensis* normalen Dimensionen erreicht, und auch die Flügelänge kein sicheres Kriterium abgibt.

Flügelänge in mm. :

Australien : 121†, 121†, 122†, 123†, 124†, 124†, 124†, 124†, 124 [P], 125, 125†, 125†, 125†, 126, 126†, 126†, 126†, 126-5†, 127†, 127†, 127†, 127†, 127†, 128\*, 128†, 128†, 128†, 128†, 128†, 128†, 128†, 128†, 129, 129, 129\*, 129†, 129†, 129†, 129†, 130, 130†, 130†, 130†, 130†, 131\*, 131†, 131†, 131†, 131†, 131†, 131†, 131†, 132, 132, 132, 132, 132†, 132†, 133, 133\*, 133†, 133†, 133†, 134†, 134†, 134†, 134-5†, 135, 135†, 135†. *Durchschnitt* von 76 Ex. : 128·9 mm. [9 Ex. nach F : 130—137 ; 3 Ex. nach B : 125—127].

S.O.-Neuguinea : 128·5, 129, 130 [M : 128—130].

Fergusson-Insel : 133\*.

*Verbreitung* : Australien ; Südost-Neuguinea, Fergusson-Insel.

## 7. *Artamus leucorhynchus papuensis* Bp.

*Artamus papuensis* Bonaparte, *Consp. Av.* vol. i p. 344 (1850—Neuguinea ; Timor). *Patr. restr.* : Westliches Neu-Guinea.

Unter diesem Namen möchte ich vorläufig die Vögel von den Molukken, den westlichen papuanischen Inseln und von Neuguinea, mit Ausnahme seines südöstlichen Teiles, vereinigen. Sie stehen der australischen Form sehr nahe, sind aber in der Regel langschnäbliger, in Durchschnitt auch langflügliger. Verglichen mit *A. l. celebensis* sind sie durchschnittlich kleiner, und das Grau an Oberkopf, Kehle und Kropf pflegt dunkler zu sein. Aru-Vögel scheinen zwischen den Formen *papuensis* und *leucopygialis* zu vermitteln.

Flügelänge in mm. :

Aru : 128, 128\*, 128·5\*, 129, 131, 131·5, 133, 134, 134.

Kei-Inseln : 131, 134, 135.

Taam : 132, 133, 135, 135, 137.



- Goram : 129\*, 130.  
 Ceramlant : 139.  
 Ceram : 130, 134, 135, 136·5.  
 Ambon : 130, 133.  
 Buru : 136, 136\*.  
 Batjan : 130, 134\*, 135\*, 136\*, 137\*, 140.  
 Halmahera : 129†, 132, 132†, 133†, 133\*, 134\*, 134, 135†, 135†, 136, 136 [M].  
 Ternate : 131 [M], 132 [M].  
 Morotai : 133, 133\*, 136.  
 • Waigeu, Salawatti, Gebe, Bataanta : 135\*, 135\*, 136†, 136†, 136, 137, 138,  
 140 [M].  
 Misol : 134\*, 136\*, 139\*.  
 Niederl. Neu-Guinea : 135.  
 Astrolabebai : 136 [P].

### 8. *Artamus leucorhynchos melaleucus* (Forst.).

*Loxia melaleuca* Forster, *Descr. Anim.* p. 272 (1844—Neu-Kaledonien).

*Ocypterus berardi* Bonaparte, *Compt. Rend.* vol. 38 p. 538 (1854—Neu-Kaledonien).

Oberkopf, Kopfseiten, Kehle und Kropf meist noch schwärzlicher als bei *A. l. musschenbroeki*; auch der Rücken ist dunkler, aber in der Regel mit ausgesprochen bräunlichem Ton und infolgedessen deutlicher gegen die Färbung des Oberkopfes abgesetzt. Schnabel schlanker als bei der Tenimberform.—Stücke von den Neuen Hebriden scheinen durchschnittlich in den Massen hinter solchen von Neu-Kaledonien und den Loyalty-Inseln zurückzustehen und dürfen wahrscheinlich als eigene Form abgetrennt werden.

Flügelänge in mm.:

Neu-Kaledonien : 128\*, 129\*, 131\*, 131\*, 132\*, 133\*, 133\*, 134\*.

Loyalty-Inseln : 130\*, 132, 133\*.

Neue Hebriden : 122, 123\*, 124, 124\*, 127\*, 128\*, 128\*.

*Verbreitung* : Neu-Kaledonien, Loyalty-Inseln, Neue Hebriden.

### 9. *Artamus leucorhynchos pelewensis* Finsch.

*Artamus pelewensis* Finsch, *Journ. Mus. Godeffr. Heft* 12 p. 41 (1876—Palau).

Der vorigen Form sehr nahe stehend, aber in der Regel durch die schwärzlichere, weniger bräunliche Färbung des Rückens und den an der Basis höheren Schnabel, der in der Form mit demjenigen von *A. l. musschenbroeki* übereinstimmt, unterscheidbar.

Flügelänge in mm.:

Palau : 135\*.

*Verbreitung* : Palau.

## XX. Über einige Formen von *Hypothymis azurea* (Bodd.).

Mr. Oberholser hat in *Proc. U. St. Nat. Mus.* vol. 39, 1911, pp. 593–615 auf Grund der Untersuchung eines reichen Materials eine weitgehende Aufteilung dieser Art vorgenommen. Er erkennt in seiner ausgezeichneten Arbeit 16 Formen an, von denen ich die folgenden nach den Serien in den Museen zu Tring und London prüfen und bestätigen konnte.

**Hypothymis azurea azurea** (Bodd.).

Flügelänge in mm. (♂♂ ad.):

Philippinen: 65\*, 65\*, 65·5\*, 65·5, 67, 67\*, 67·5\*, 67·5\*, 68, 68, 68, 68, 68\*, 68\*, 68\*, 68\*, 68\*, 68·5\*, 69, 69, 69\*, 69\*, 69\*, 69\*, 69\*, 69\*, 70, 70, 70\*, 70\*, 71, 72, 72, 72, 73\*.

Sulu-Archipel: 66, 69.

Palawan: 69·5, 71.

35 ♂♂: *Durchschnitt* 68·6, *Variation* 65—73 mm. [Oberholser: 25 ♂♂: *Durchschnitt* 67·6, *Variation* 65—72·5 mm.].

*Verbreitung*: Philippinen, Sulu-Archipel, Palawan-Gruppe.

**Hypothymis azurea prophata** Oberh.

Flügelänge in mm. (♂♂ ad.):

Malakka: 68\*, 68\*, 69, 69, 69\*, 69\*, 69\*, 69\*, 69\*, 70, 70, 70, 70\*, 71\*, 71·5\*, 72, 72, 72\*.

Borneo: 67·5\*, 68\*, 70\*, 70·5, 71\*, 71\*, 71, 71, 71·5, 71·5\*, 72\*.

Sumatra: 70\*.

Lingga: 70·5.

31 ♂♂: *Durchschnitt* 70·1, *Variation* 67·5—72 mm. [Oberholser: 12 ♂♂: *Durchschnitt* 70·5, *Variation* 66·5—72·5 mm.].

Die Unterschiede zwischen dieser und der typischen Form sind zwar sehr gering, aber bei Serien doch deutlich genug hervortretend, um eine Abtrennung zu rechtfertigen. Sie bestehen, ausser in der durchschnittlich etwas bedeutenderen Grösse, darin, dass—wie bereits durch Oberholser *l.c.* p. 597 angegeben wurde—die Seiten und die obere Region des Unterkörpers stärker bläulich verwaschen sind, und dass das Weiss des Bauches gewöhnlich weniger rein ist.

*Verbreitung*: Malakka, Nieder-Siam (?), Sumatra, Java, Bali (?); Grosse Karimon-Insel, Lingga-Archipel, Borneo, Bangka und Billiton.

**Hypothymis azurea symmixta** subsp. n.

Exemplare von den kleinen Suidainseln östlich von Bali sind nicht mit der Form *prophata* ident, sondern unterscheiden sich in der Regel von ihr durch helleren, ausgesprochener blauen, viel weniger violett getönten Rücken; auch die Färbung von Kehle und Kropf ist ausgesprochener lazurblau. Nach dem bisher untersuchten Material hat es den Anschein, als erreichten die Vögel von Flores und Alor geringere Durchschnittsmasse als diejenigen von den übrigen Inseln. Von Bali liegen mir nur 2 ♂♂ vor, von denen das eine in der Färbung mit *H. a. prophata*, das andere dagegen mit *H. a. symmixta* übereinstimmt, sodass diese Insel wahrscheinlich eine Übergangsform beherbergt.

Flügelänge in mm.:

♂♂ ad.:

Bali: 69·5 (*symmixta*-Typ), 70 (*prophata*-Typ).

Lombok: 67, 70, 71, 72·5, 73·5.

Sumbawa: 68, 69, 70, 71, 72, 72.

Flores: 67·5\*, 68\*, 68\*, 69\*, 69\*, 70\*, 70.

Alor: 67·5, 69.

20 ♂♂: *Durchschnitt* 69·6, *Variation* 67—73·5 mm.

♀ ♀ ad. :

Bali : 72.

Sumbawa : 66, 66·5, 67.

*Typus* : ♂ Alor, März 1897, A. Everett coll., im Tring Museum.

*Verbreitung* : Bali (?), Lombok, Sumbawa, Flores, Alor.

### **Hypothymis azurea gigantopectera** Oberh.

3 ♂♂ des Tring-Museum bestätigen vollkommen die von Oberholser für diese neue Form angegebenen Kennzeichen.

Flügelänge in mm. :

Bunguran : ♂ 73 ; ♀ 67, 68.

Sirhassen : ♂ 73·5, 74 ; ♀ 72, 73.

3 ♂♂ : *Durchschnitt* 73·5, *Variation* 73—74 mm. [Oberholser : 2 ♂♂ : *Durchschnitt* 74, *Variation* 73·5—74·5 mm.].

*Verbreitung* : Natuna-Archipel.

### **Hypothymis azurea oberholseri** subsp. n.

Oberholser hat infolge Mangels an Material die Formosavögel vorläufig zu *H. a. azurea* gestellt. Dieselben repräsentieren indessen eine distinkte Unterart, deren Charaktere sich dahin zusammenfassen lassen : In der Färbung sehr ähnlich *H. a. azurea*, aber der Rücken ist einen Schein weniger violett getönt, der schwarze Nackenfleck ist meist grösser und die Durchschnittsgrösse beträchtlich bedeutender. In der Flügelänge stimmt sie etwa mit *H. a. gigantopectera* überein, die indessen eine viel stärker violett getönte Rückenfärbung aufweist, und bei der das Weiss des Unterkörpers nicht so weit nach oben ausgedehnt ist. *H. a. styani* ist durchschnittlich kleiner, und die weisse Färbung der Unterseite erstreckt sich höher hinauf.

Flügelänge in mm. :

♂♂ ad. : 71, 71, 71, 71·5, 71·5\*, 72, 72, 72, 72\*, 72\*, 72\*, 72\*, 72·5\*, 73, 73, 73\*, 73\*, 73\*, 73·5, 74, 74\*, 74\*, 74\*, 75, 75, 75\*, 76\*, 77\*.

29 ♂♂ : *Durchschnitt* 73·0, *Variation* 71—77 mm.

♀ ♀ ad. : 68, 69, 69, 69·5, 69·5, 70, 70, 71, 71, 71, 73.

*Typus* : ♂ Sharaikisha, Formosa, 5. iv. 1907, coll. Alan Owstons Japanische Sammler, im Tring Museum.

*Verbreitung* : Formosa.

### **Hypothymis azurea styani** (Hartl.).

*Siphia styani* Hartlaub, *Abh. Nat. Ver. Bremen* vol. xvi Teil 2 p. 248 (1898 —Hoihow und Nodouha auf Hainan).

Hartert zieht in *Nov. Zool.* vol. xvii 1910 p. 225 die Hainanvögel zu *H. a. coerulescephala*. Er hat sie aber offenbar nicht mit Vorderindischen Exemplaren, sondern mit solchen von Burma und Assam verglichen, die irrtümlicherweise bisher mit *coerulescephala* vereinigt wurden. Hinterindische Exemplare und solche vom Himalaya lassen sich in der Tat von Hainanern nicht abtrennen. Sie unterscheiden sich von *prophata* und *azurea* durch den ausgesprochenen blauen, weniger violett getönten Rücken, der gleichzeitig etwas dunkler ist als

bei *symmixta*. Der schwarze Nackenfleck ist so gross wie bei *prophata* und *symmixta* und durchschnittlich grösser als bei *azurea*. Die weisse Färbung des Unterkörpers ist relativ sehr rein, wie bei *coeruleocephala* und *ceylonensis*, und erstreckt sich höher hinauf als bei *azurea*, *oberholseri*, *prophata* und *symmixta*. Verglichen mit *H. a. coeruleocephala* und *ceylonensis* ist der Kopf von viel leuchtenderem, reinerem Blau, nicht violett getönt, und das schwarze Kropfband ist wohl ausgebildet, nicht nur angedeutet.

Flügelänge in mm.:

Hainan: ♂ 67, 68, 71, 71, 71·5, 72, 72·5, 72·5, 73.

♀ 67, 69, 69, 69, 70, 70, 70·5, 71, 73.

Tenasserim: ♂ 72, 72\*, 72·5, 72·5\*, 72·5\*, 72·5\*, 73·5\*, 75\*.

Burma und Shan-Staaten: ♂ 68\*, 69\*, 69·5, 69·5\*, 70\*, 70\*, 70\*, 70·5\*, 71\*, 71\*, 71\*, 71·5\*, 72\*, 73\*, 73\*, 74\*.

Assam, Cachar, Bengalen: ♂, 67·5, 68\*, 68\*, 68·5\*, 71\*, 71\*, 71\*, 71·5, 72, 72\*, 72·5, 73\*, 73\*, 75\*.

Sikkim, Nepal, Bhutan: ♂ 71\*, 71·5\*, 72\*, 72\*, 72\*, 73, 74\*.

Raipur: 70\*, 71\*, 71\*, 72\*, 72\*, 72\*.

Cochinchina: 69\*, 73\*, 73\*.

9 ♂♂ von Hainan: *Durchschnitt* 70·9, *Variation* 67—73 mm.

54 ♂♂ von Kontinent: *Durchschnitt* 71·4, *Variation* 67·5—75 mm.

*Verbreitung*: Hainan, Siam (?), Cochinchina, Tenasserim, Burma, Assam, Bengalen, Himalayaländer, Nordindien südlich bis zum Deccan.

### **Hypothymis azurea coeruleocephala** (Sykes).

*Muscicapa coeruleocephala* Sykes, P. Z. S. 1832 p. 85 (Deccan).

Die vorderindische Form ist im männlichen Geschlecht von allen übrigen weissbänchigen mit Ausnahme der ceylonesischen durch die Kopffärbung unterschieden, die nicht leuchtend azurblau, sondern stark violett getönt ist wie der Rücken. Von *H. a. ceylonensis* weicht sie hauptsächlich durch die etwas deutlichere schwarze Kropfbinde und den etwas grösseren Nackenfleck ab.

Flügelänge in mm.:

Mysore: ♂ 71, 71.

Travancore: ♂ 68\*, 69\*.

Nilghiri-hills: ♂ 69\*.

Bombay: ♂ 69.

Malabar: ♀ 65.

*Verbreitung*: Vorderindien, etwa vom Deccan an südwärts.

### **Hypothymis azurea ceylonensis** Sharpe.

Herr Dr. von Madarász betrachtet in seinem Reisebericht ("Die Ornithol. Ergebn. meiner Reise nach Ceylon," *Természetrájsi Füzetek* vol. xx 1897 p. 341) die Ceylonform als ident mit *Hypothymis azurea* (Sharpe nec Boddaert!) da "bei allen meinen Exemplaren das schwarze Halsband—wenn auch nur in geringem Masse—vorhanden ist." Die mir vorliegenden Ceylonmännchen bestätigen dies; sie zeigen aber zugleich, dass bei *ceylonensis* das Kropfband schwächer ausgebildet ist als bei irgend einer anderen Form und nur undeutlich erkennbar ist. Im violetten Ton des Kopfes stimmt die Form mit der vorderindischen überein, bei der wiederum der Nackenfleck grösser ist.

Flügelänge in mm. :

♂ 69\*, 70\*, 70·5 ; ♀ 65·5, 67 [nach v. Madarász, l.c.: ♂ 68, 73, 74 ; ♀ 70].

Verbreitung : Ceylon.

### **Hypothymis azurea idiochroa** Oberh.

3 Exemplare im Tring-Museum ; davon ein ♂ und ein ♀ mit der Localitätsangabe Car Nicobar : Flügel 75 resp. 69·5 mm ; ein zweites ♂ mit der Angabe "Nicobaren" und einer Flügelänge von 75·5 mm. stammt offenbar von der gleichen Insel.

Verbreitung : Car Nicobar.

### **Hypothymis azurea calocara** Oberh.

Flügelänge in mm. :

♂♂ ad. :

Kondul (zwischen Gross- u. Klein-Nicobar) : 65\*, 66\*, 66\*, 67\*.

Montschal (östl. von Klein-Nicobar) : 67\*.

Tilanchong : 65·5\*.

Trinkut : 67\*, 67\*.

Teresa : 67\*.

Camorta : 69\*.

Nankauri : 68\*.

11 ♂♂ : Durchschnitt 66·9, Variation 65—69 mm. [Oberholser : 8 ♂♂ : Durchschnitt 67·6, Variation 65—69 mm.].

Verbreitung : Nicobaren mit Ausnahme von Car Nicobar.

### **Hypothymis azurea tytleri** (Beavan).

Flügelänge in mm. :

Süd-Andaman : ♂ 70·5\*, 71\*, 72\*, 72\*, 72·5, 73\*, 73\*, 73\*, 73\*, 73\*, 73\*, 73\*, 73·5, 73·5\*, 74\*, 74\*, 74\*, 74\*, 74, 75\*, 75·5, 76 ; ♀ 69, 71·5, 73·5.

Little Cocos Island : ♂ 70.

23 ♂♂ : Durchschnitt 73·2, Variation 70—76 mm. [Oberholser : 2 ♂♂ : Durchschnitt 73, Variation 71—75 mm.].

Verbreitung : Andamanen, Grosse u. Kleine Kokos-Insel.

### **Hypothymis azurea richmondi** Oberh.

Flügelänge in mm. :

Bua-bua (Engano) : ♂ 75.

[Oberholser : 11 ♂♂ : Durchschnitt 72·9, Variation 69·5—74·5 mm.]

Verbreitung : Engano.

## **XXI. Die Formen von *Eurystomus orientalis* (L.).**

### **Übersicht (Alterskleid).**

A. Apicalhälfte der Stenerfedern regelmässig schwarz ohne blaue Aussensäume ; Unterkörper lebhaft grünlich blau :

a. Flügelänge 172—194 mm., Schnabel schmaler . *Eu. o. orientalis*.

b. Flügelänge 191—205 mm., Schnabel breiter . *Eu. o. gigas*.

- B. Apicalhälfte der Aussenfahne der Steuerfedern oder wenigstens ihres Aussensaumes meist (aber nicht immer) blau mit Ausnahme der äussersten Spitze; Unterkörper lebhaft grünlich blau. Flügellänge 180—203 mm. . . . . *Eu. o. calonyx.*
- C. Apicalhälfte des Aussensaumes der Steuerfedern schwarz, oder blau in variierender Ausdehnung; Unterkörper blass blau mit grauem Ton. Flügellänge 179—202 mm. . . . . *Eu. o. pacificus.*
- D. Färbungsvariabilität der Steuerfedern und Flügellänge wie bei C, aber Unterkörper etwas bläulicher und lebhafter gefärbt . *Eu. o. connectens.*
- E. Ganze Aussenfahne der Steuerfedern regelmässig dunkel cyanblau, Unterkörper in der Regel noch bläulicher als bei A und B, weniger grünlich. Flügel 190—210 mm. (meist über 200 mm.).
  - a. Spitze des Oberschnabels in der Regel rot.
    - 1. Schaftstriche der Federn des Kehlfleckes wesentlich heller als die übrige Feder . . . . . *Eu. o. solomonensis.*
    - 2. Schaftstriche der Federn des Kehlfleckes nur wenig heller als die übrige Feder . . . . . *Eu. o. neohonoreranus.*
  - b. Spitze des Oberschnabels stets schwarz . . . . . *Eu. o. crassirostris.*

Es bedeuten im folgenden :

Massangaben ohne Zusatz : Exempl. des Tring-Museums.

„ mit einem \* : „ „ British Museum.

P = nach Parrot, Beiträge zur Ornithologie Sumatras.

B = nach W. Blasius, *Zeitschr. Ges. Orn.* vol. iii. p. 90.

S = nach Stejueger, *Proc. U. St. Nat. Mus.* vol. x. 1887 p. 403.

### 1. *Eurystomus orientalis orientalis* (L.)

*Coracias orientalis* Linnaeus, *Syst. Nat.* Ed. xii p. 159 (1766—“ Ostindien,“ ex Brisson; patr. (a nobis). design.: Java).

*Eurystomus cyanicollis* Vieillot, *Nouv. Dict. d'Hist. Nat.* vol. xxix p. 425 (1819—“ Indien “).

*Eurystomus fuscicapillus* Vieillot *l.c.* p. 426 (1819—“ Ostindien,“ aus Buffon, der seine Angaben aus Brisson schöpft).

Flügellänge in mm. :

Bali : 187, 188.

Java : 183 [P], 183 [P], 187 [P], 188\*, 191\*.

Sumatra : 176 [P], 178 [P], 179 [P], 184, 185 [P], 185 [P], 187 [P].

Borneo : 185, 189, 189, 190\*.

Sibutu : 181.

Sulu-Archipel : 178, 181.

Philippinen : 176\*, 178\*, 178\*, 179\*, 179\*, 179, 180\*, 180\*, 181, 181\*, 181\*, 182\*, 182\*, 183, 183\*, 183\*, 183\*, 184\*, 184\*, 184, 186\*, 187\*, 187\*, 187\*, 187, 188, 188\*, 188\*, 188\*, 190\*, 194.

Nord-Celebes, Siao, Sangir und Talaut : 172, 175, 176, 176, 176, 179, 180, 180, 180, 182, 183, 183 [B], 183 [B], 185, 192.

66 Ex. : *Durchschnitt* 183.2, *Variation* 172—194 mm.

Standvogel in : Sumatra, Billiton, Java, Bali, Borneo, Labuan, Sibutu, Sulu-Archipel, Philippinen, Siao, Sangir, Talaut, Celebes mit Ausnahme der südlichen Halbinsel.

### 2. *Eurystomus orientalis gigas* subsp. n.

In der Färbung stimmt diese Form vollkommen mit der vorigen überein; sie ist indessen im Durchschnitt wesentlich grösser, insbesondere ist die gewaltige Breite der Schnabelbasis ein sehr charakteristisches und constantes Merkmal. Hierauf hat bereits Sharpe in *P. Z. S.* 1890 p. 551 aufmerksam gemacht: "It (*Eurystomus orientalis*) is also found in the Andamans, the bird from this locality being remarkable for a somewhat larger bill."

Über das Vorkommen der Art vergl. Hume, *Stray Feathers* vol. ii. p. 165: "None of us observed this (*Eurystomus orientalis*) anywhere except in the neighbourhood of Port Blair. I do not know whether this is a permanent resident, but suppose it must be so; we obtained it from September to April, and specimens have been sent killed in September."

Ganz junge Stücke, noch ohne lazurblaue Kehlfedern (die zuweilen bereits auftreten, bevor das Grossgefieder ausgewachsen ist!) befinden sich im British Museum, gesammelt bei Port Blair am 17. vii. und 1. und 22. viii. 1873.

Flügelänge in mm.:

Südliche Andamanen: 191\*, 192\*, 192.5, 193\*, 193\*, 195\*, 195\*, 195\*, 197\*, 198, 198\*, 198\*, 198\*, 199, 202, 202, 203, 203\*, 205\*—19 Ex.: *Durchschnitt* 196.8 mm.

*Typus*: Rutland-Insel, Andamanen, 4. iii. 1907, B. B. Ostmaston coll., im Tring-Museum.

*Verbreitung*: Südliche Andamanen.

### 3. *Eurystomus orientalis calonyx* Sharpe.

[*Eurystomus calorynx* Hodgson, in Gray's *Zool. Misc.* p. 82 (1844—Nepal; nomen nudum!).

*Eurystomus calonyx* Sharpe, *P. Z. S.* 1890 p. 551—terra typica: Nepal, Typus im British Museum.

? *Eurystomus laetior* Sharpe *l.c.* p. 551 (1890—Malabar, Nilghiris, Ceylon).

Im östlichen und nördlichen Teil ihres Verbreitungsgebietes (das nördliche und mittlere China, Korea, Japan, die Amurländer und Kamtschatka) scheint diese Form stets in mehr oder weniger ausgesprochenem Grade die charakteristische Schwanzfärbung zu besitzen (cf. La Touche, *Ibis* 1900 p. 44), während in Hainan, den Himalayaländern, Hinterindien und Malakka zur Brutzeit sowohl Vögel angetroffen werden, bei denen die apicale Hälfte des Aussensaumes der Steuerfedern blau ist, wie solche, die sich in der Schwanzfärbung nicht von der typischen Form unterscheiden lassen. So vertreten z. B. zwei ganz junge Vögel des Brit. Mus., von Mandelli im Juli 1874 in Sikkim gesammelt, die beiden Färbungstypen. Die Färbung der Steuerfedern ist mithin kein ausreichendes Merkmal zur Kennzeichnung der Form; vielmehr muss beim Vergleich mit *E. o. orientalis* noch die bedeutendere Durchschnittsgrösse, gepaart mit relativ geringer Breite des Schnabels, hervorgehoben werden. Wenn daher Stejneger (in *Proc. U. St. Nat. Mus.* vol. xvi, 1893, pp. 627–8) bei zwei Exemplaren von Kiu-Schin (Japan) und 4 von Tuschima die von Sharpe als charakteristisch für *calonyx* angegebene blaue Schwanzfärbung feststellt, dagegen bei (wieviel?) Lutsch-Stücken dieselbe vermisst, so berechtigt dies m. E. nicht zu der Annahme, "We have, consequently, in Japanese territory two species, or forms, of *Eurystomus*—*E. orientalis* in the Liu-kius, probably travelling south over Formosa to the Philippines, and *E. calonyx*, the migration route of which is more westerly over China to the Malayan peninsula."

Ob sich vorderindische Exemplare als selbständige Form abtrennen lassen oder nicht, muss weiteres Material ergeben; die von Sharpe angeführte "lebhaftere Färbung" scheint kein Charakteristikum zu sein, und die vier Exemplare des Brit. Mus. geben zu keiner Sonderstellung Anlass.

In Tenasserim und Malakka scheinen zur Brutzeit "blauschwänzige" Stücke weit seltener zu sein als "schwarzschwänzige"; von letzterer Localität habe ich nur 2 Sommervogel vom "echten *calonyx*-Typus" gesehen (vii. 1877, im Brit. Mus.), während im Himalaya diese Färbungsphase entschieden dominiert. Da gleichzeitig die Flügellänge der Malakkavögel im Durchschnitt geringer ist, darf man sie vielleicht als Übergänge zur typischen Form auffassen und sie durch die Formel

***Eurystomus orientalis orientalis*  $\leq$  *calonyx***

bezeichnen.—Über das Auftreten der Art in der malayischen Halbinsel sind die Angaben von Robinson und Kloss in *Ibis* 1911 p. 32 zu vergleichen. Die genannten Autoren nehmen an, dass beide Formen, *Eu. o. orientalis* und *calonyx*, nebeneinander in diesem Gebiet vorkommen, bemerken aber gleichzeitig: "considerable variation is met with in the amount of blue on the tail-feathers." Die Annahme des Bestehens einer Übergangsform scheint mir diese Erscheinung in der befriedigendsten Weise zu erklären.

Sharpe vermutete, dass *Eu. calonyx* im Winter als Gast aus dem Norden im Malayischen Archipel auftrete, auf Grund vereinzelter Vorkommens "blauschwänziger" Stücke auf verschiedenen westlichen Inseln. Robinson und Kloss erklären *l.c.* die Art für einen sicheren Zugvogel, "being commoner during the winter months and having been met with on the small islands in the middle of the Straits of Malacca." Über ihre Zugvogelnatur vergl. ferner:

La Touche, *Ibis* 1900 p. 44 (Kuatun); La Touche und Rickett, *Ibis* 1905 p. 48 (Fokien); Styan, *Ibis* 1887 p. 229 (Futschau); Taczanowski, *P. Z. S.* 1888 p. 462 (Korea); La Touche, *Ibis* 1907 p. 5 (Tschinkiang), etc.

Bisher wurden zweifellose *calonyx* im Bereiche des Archipels gesammelt auf: Borneo (Brunei ii. 1898; Mt. Penison; beide Ex. im Brit. Mus.); Simalur (15. xii. fide Richmond, *Proc. U. St. Nat. Mus.* vol. xxvi, 1903, p. 497); Bunguran (X. im Tring-Museum); Sumatra (3 Ex. von Padang und 1 von den Lampongs, Winter 1901, fide Stone, *Proc. Acad. Nat. Sc. Philad.* 1902 p. 673).

Flügellänge in mm.:

*A. Blauschwänziger Typus:*

Kambodja: 193\*.

Amur-bai: 188.

Sidemifluss (Ost-Sibirien): 194.

Nordchina: 182\*; Ningpo: 194; Weihaiwei: 192; Futschau: 185, 186\*, 190\*, 194\*; Fokien: 195; Whampoa bei Macao: 180\*, 192\*.

Hainan: 180\*, 183, 185, 197, 198.

Südl. Shan-Staaten: 195\*.

Nepal: 191\*, 191\*, 194\*, 194\*.

Sikkim: 188\*, 189\*, 190\*, 191\*, 193\*, 194\*, 194\*, 196\*, 198\*.

Assam, Cachar, Manipur und Oberburma: 183\*, 186, 187, 200\*, 200\*, 200, 200, 201, 201\*, 201\*, 202\*, 202\*, 203\*.

Pegu: 192, 194.

Tenasserim: 197, 197.



Malakka : 180\*, 185\*, 189\*, 189\*, 190\*, 191\*, 199\*.

Pulu Saban bei Singapore : 189\*.

Bunguran : 194.

Brunei : 183\*.

B. *Schwarzschwänziger Typus* :

Lutschu-Inseln : 180 [S].

Hainan : 189.

Siam : 188\*.

Burma : 187, 189, 190.

Cachar : 192.

Tenasserim : 183\*, 184\*, 185\*, 185\*, 186\*, 186\*, 187\*, 189, 190, 192, 193, 200.

Malakka : 178, 179\*, 180\*, 180\*, 181\*, 182\*, 182, 186\*, 186, 186, 187, 187\*, 188\*, 191\*, 194\*.

Salanga : 199\*.

Singapore : 189\*, 193\*.

Ceylon : 184\*.

Travancore : 197\*.

59 Ex. vom blauschwänzigen Typus : *Durchschnitt* 192·2, *Variation* 180—203 mm.

39 Ex. vom schwarzschwänzigen Typus : *Durchschnitt* 187·2, *Variation* 178—200 mm.

4. *Eurystomus orientalis pacificus* (Lath.).

*Coracias pacifica* Latham, *Ind. Orn. Suppl.* p. xxvii (1801—Australien). Cf. Sharpe, *Hist. Coll. Brit. Mus.* vol. ii p. 119.

*Eurystomus australis* Swainson, *Anim. in Menag.* p. 326 (1838—Neu Holland).

*Eurystomus orientalis bravi* Mathews, *Nov. Zool.* vol. xviii p. 285 (1912—Nordwest-Australien).

Diese Form ist als Brutvogel aller Wahrscheinlichkeit nach auf Australien beschränkt; sie ist dort, wenigstens für die südlichen Gegenden, Zugvogel, und erscheint in den Wintermonaten der Südhemisphäre auf Neuguinea, dem Louisiade- und D'Entrecasteaux-Archipel, den westlichen papuanischen Inseln, den Nord- und Süd-Molukken, sowie auf den Südost-, Kei- und Aru-Inseln. Verirrte wurden auch auf Neuseeland geschossen.

Flügelänge in mm. (die in Klammer gesetzten römischen Zahlen dienen zur Bezeichnung des Sammelmonats):

Australien : 186 (XI), 189 (XI), 189 (XII), 191 (XI), 191 (XI), 192 (XI), 193 (X), 193 (XI), 195 (XI), 198 (XI), 198 (XI), 198 (IV), 199 (XI).

Neuguinea : 188 (VI), 197 (V), 198 (IX), 199 (IX).

Salawatti : 182 (V), 198 (V).

Batanta : 188 (VII).

Ceram : 179 (V), 182 (X), 185 (V), 185 (IX), 190 (V), 202 (IV).

Banda : 192 (IX).

Teor : 191 (X).

Goram : 189 (XI).

Halmahera : 182, 182, 193.

Kei : 188 (IX), 188 (IX), 192 (IX).

Aru : 187 (VI), 190 (VI), 192 (VI), 196 (V), 198 (V).

40 Exemplare : *Durchschnitt* 191·1, *Variation* 179—203 mm.

5. *Eurystomus orientalis connectens* subsp. n.

Der australischen Form sehr nahe stehend, aber durch etwas lebhaftere, bläulichere Unterseite unterschieden und zu *Eu. o. orientalis* überleitend.

Im Tring-Museum befinden sich folgende Jungvögel, deren Schwingen noch nicht vollständig ausgewachsen sind, die also noch nicht imstande waren, einen Flug über See auszuführen :

Sumba : xii. 1896, A. Everett coll.

Wulur auf Damar : 11. und 18. xii. 1898, H. Kühn coll.

Flügelänge in mm. :

Bonthain (Süd-Celebes) : 191.

Kalidupa : 195.

Djampea : 195, 198.

Sumbawa : 187, 192, 197, 199.

Sumba : 192, 193, 193, 194.

Flores : 198, 200.

Alor : 193.

Wetter : 194.

Kisser : 188, 189.

Leti : 189, 193.

Damar : 190, 193, 193.

Luang : 184, 187.

Moa : 188, 190, 197, 198.

Tenimber : 188, 192.

Lombok : 191.

Kangean : 185.

35 Ex. : Durchschnitt 192.5, Variation 184—200 mm.

Typus : ♂ Moa, 18. xi. 1902, H. Kühn coll., im Tring-Museum.

Verbreitung : Inselkette von Kangean und Lombok bis Tenimber ; Djampea, Kalidupa, Süd-Celebes.

*Eurystomus orientalis* subsp. ?

Auf den Nordmolukken scheinen drei *Eurystomus*-formen aufzutreten : (1) der durch seine dunkel azurblaue Färbung und das Fehlen aller grünlichen Töne im Kleingefieder (diese sind auf den Flügel Spiegel beschränkt) scharf markierte *Eurystomus azureus* Gray ; (2) *Eurystomus orientalis pacificus* als Wintergast ; und (3) eine Form, die bisher meist mit *Eurystomus orientalis orientalis* identifiziert wurde (cf. Salvadori, *Orn. Pap.* vol. i p. 507 ; Guillemard, *P. Z. S.* 1885 p. 568), sich jedoch von letzterem durch meist etwas blässere Färbung und durch die durchschnittlich bedeutendere Grösse unterscheidet. Die meisten der mir vorliegenden Stücke stimmen völlig mit *Eu. o. connectens* überein, zwei dagegen sind bläulicher als das in dieser Hinsicht extremste Stück der *connectens*-Reihe.

Flügelänge in mm. :

Halmahera : 181, 186, 191, 192.

Batjan : 194, 199.

Tidore : 191.

Ternate : 179, 179, 199.

6. *Eurystomus orientalis solomonensis* Sharpe.

*Eurystomus solomonensis* Sharpe, *P. Z. S.* 1890 p. 552—Salomons-Inseln.

*Verbreitung*: Salomons-Inseln.

7. *Eurystomus orientalis crassirostris* Scl.

*Eurystomus crassirostris* Sclater, *P. Z. S.* 1869 p. 121—"Salomons-Inseln." Patr. subst.: Neu-Pommern, cf. Rothschild & Hartert, *Nov. Zool.* vol. x p. 197.

*Eurystomus waigiouensis* Elliot, *Ibis* 1871 pp. 203-4—Waigeu.

*Verbreitung*: Neu-Guinea, Neu-Pommern, Neu-Lauenburg, Louisiade- und D'Entrecasteaux-Archipel, Waigen und Misol.

8. *Eurystomus orientalis neohanoveranus* Hart.

*Eurystomus neohanoveranus* Hartert, *Nov. Zool.* vol. viii p. 185 Ann. (1901—Neu-Hannover).

*Verbreitung*: Neu-Hannover

**XXII. Die Formen von *Amaurornis phoenicura* (Forster).**

In *Nov. Zool.* vol. xi, 1904, pp. 154-5 unterscheidet Hartert 3 Formen dieser Art: *A. ph. phoenicurus*, *insularis* und *leucomelaena*. Die Feststellung des Flügelmasses bei grösseren Serien veranlasste mich, von der erstgenannten noch zwei weitere Formen abzutrennen.

1. *Amaurornis phoenicura phoenicura* (Forster).

*Rallus phoenicurus* Forster, *Zool. Ind.* p. 19 t. ix (1781—"Zeylan und ganz Indien"). Patr. restr.: Ceylon.

Flügelänge in mm.:

(♀) 144\*, 145\*, 150\*, 150\*, 150, 151\*, 152 [M], 153.

(♂) 159\*, 159\*, 165\*, 164, 165 [M].

13 Ex.: *Durchschnitt* 154.1, *Variation* 144—165 mm.

Eine Anordnung der Masse nach dem Geschlecht konnte bei dieser und den folgenden Formen nicht vorgenommen werden, da dasselbe nur in wenigen Fällen auf der Etikette der untersuchten Stücke zuverlässig angegeben war. Aus den wenigen glaubwürdigen Vermerken lässt sich indessen mit einiger Wahrscheinlichkeit entnehmen, dass die ♂ beträchtlich grösser zu sein pflegen als die ♀♀, so dass man z. B. bei der vorliegenden Form die Variationsbreite des Flügelmasses beim ♀ als 144—153, beim ♂ als 159—165 mm. annehmen darf.

M (in der obigen Masstabelle) = nach Madarász, *Termesztrajzi Füzetek* vol. xx, 1897, p. 386.

*Verbreitung*: Ceylon.

2. *Amaurornis phoenicura javanica* (Horsf.).

*Gallinula javanica* Horsfield, *Trans. Linn. Soc. Lond.* vol. xiii p. 196 (1822—Java).

*Rallus sumatranus* Raffles, *ibid.* vol. xiii p. 328 (1822—Sumatra).

? *Amaurornis phoenicura cleptea* Oberholser, *Smiths. Misc. Coll.* vol. lx No. 7 p. 2 (1912—Nias).

Wie die vorige Form, aber im Durchschnitt etwas kleiner, und die Oberseite meist etwas grauer, weniger olivfarben.

Flügelänge in mm.:

Philippinen, Sulu, Talaut, Palawan, Borneo, Natuna, Pulu Tello, Sumatra, Java, Kangean, Bali: 136, 137\*, 138, 140, 142\*, 142\*, 145\*, 145\*, 146\*, 147, 148, 149, 150, 150\*, 159\*, 151, 151, 152, 152\*, 153\*, 153, 154, 155, 155, 158\*, 160\*, 161, 162, 163.

29 Ex.: *Durchschnitt* 149·5, *Variation* 136—163 mm.

Aus der Oberholzerschen Diagnose seiner Form *cleptea* ist nicht zu ersehen, womit er die Niasvögel verglichen hat, wenn er sie als "very much smaller" bezeichnet; da ferner alle Massangaben fehlen und die übrigen angeführten Merkmale gut auf *A. ph. javanica* passen, glaube ich *cleptea* zu deren Synonymen stellen zu dürfen, bis uns eine weniger dürftige Diagnose eines besseren belehrt.

*Verbreitung*: Natuna, Borneo, Palawan, Sulu, Philippinen, Sangir, Talaut, Sumatra, Inselkette an der Westküste Sumatras, Bangka, Java, Kangean, Bali.

### 3. *Amaurornis phoenicura leucomelana* (S. Müll.).

*Gallinula leucomelana* S. Müller, *Verh. Nat. Gesch. Land- und Volkenk.* p. 158 (1842—Timor).

*Erythra major* Bonaparte, *Compt. Rend.* vol. xliii p. 600 (1856—Timor): nomen nudum!

*Gallinula phaeops* Brüggemann, *Abh. naturw. Ver. Bremen* vol. v p. 537 (1877—"Indischer Archipel").

Adulte Exemplare unterscheiden sich sofort durch die Färbung des Kopfes von der vorigen Form: Stirn, Zügel und Kopfseiten sind grauschwarz statt weiss.

*Verbreitung*: Sumba, Wetter, Alor, Timor, Roma, Dammar. Auf diesen Inseln scheinen nur typische Stücke vorzukommen.—Im Leidener Museum befinden sich ferner 4 Ex. von Buru, von welchen 2 typische *leucomelana* zu sein scheinen, während die beiden anderen offenbar als Übergangsstufen zu *javanica* anzusehen sind (vergl.: Salvadori, *Orn. Pap.* vol. iii p. 278; Finsch, *Not. Leyd. Mus.* vol. xxvi p. 148).

### *Amaurornis phoenicura leucomelana* $\geq$ *javanica*.

Auf Celebes (und zwar anscheinend sowohl auf der nördlichen wie der südlichen Halbinsel) werden Exemplare vom "reinblütigen" *javanica*-Typ neben solchen mit den Charakteren von *leucomelana* angetroffen; häufiger dagegen scheinen Übergangsexemplare zu sein, bei denen sich der *leucomelana*-Anteil entweder nur in der schwarzen Stirn äussert, oder bei denen auch die Zügelgegend und die Kopfseiten eine grössere oder geringere Zahl schwarzer Federn neben den weissen aufweisen. Derartige Übergangsexemplare befinden sich im Tring-Museum ferner von: Buton, Kalidupa, Saleyer, Tomia, Binungko, Djampea, Flores, Sumbawa.

Vergl. hierzu die Ausführungen Brüggemanns in *Abh. nat. Ver. Bremen* vol. v p. 537.

### 4. *Amaurornis phoenicura chinensis* (Bodd.).

*Fulica chinensis* Boddaert, *Tabl. Pl. Enl.* p. 54 (1783—ex Buffon "Poule sultane de la Chine"). Ich nehme Hongkong als typische Localität an.

*Gallinula erythrura* Bechstein, *Kurze Übersicht Vög.* p. 471 (1811—"China und Vorgebirge der Guten Hoffnung").

Ähnlich *A. ph. phoenicura* und *javanica*, aber im Durchschnitt wesentlich grösser, der Rücken in der Regel ausgesprochener olivfarben, weniger grau, der Bürzel meist etwas heller, und die dunkle Isabellfärbung der Analgegend und des Unterleibes pflegt sich weiter oralwärts auszudehnen.

Flügelänge in mm.:

Südl. Vorderindien: 160, 160, 171, 173.

Nördl. Vorderindien: 154, 159\*, 163\*, 166\*, 169\*, 171\*, 172, 174, 176.

Bengalen, Burma, Assam, Nepal: 144\*, 147\*, 148\*, 150\*, 150\*, 151\*, 151\*, 151\*, 153\*, 154\*, 159\*, 160\*, 162\*, 163\*, 163\*, 165\*, 167\*, 167\*, 168\*, 171\*, 171\*, 173\*.

Sban-Staaten: 158\*.

Tenasserim: 149\*, 157\*, 161\*.

Malakka: ♀ 150\*, 153, 153·5\*, 157\*; ♂ 163\*, 167, 170\*, 171, 175\*, 175\*.

Salanga: 155\*, 160\*, 165\*, 167\*.

Siam: 150\*, 160\*.

Hainan: ♀ 151, 154, 157, 158, 158; ♂ 167, 170, 170, 171, 172, 175, 175, 175.

Formosa: 147, 157, 160, 164, 170\*, 171\*, 172.

China: Tsinling-Gebirge: 174; Futschou: 168\*, 172\*, 173; Hankau: 165\*, 173\*, 187\*; Amoy: 153.

84 Ex.: Durchschnitt 163·1, Variation 144—187 mm.

Verbreitung: Ganz Vorder- und Hinterindien, Malakka, Siam, Annam, Hainan, China, Formosa.

### 5. *Amaurornis phoenicura insularis* Sharpe.

*Amaurornis phoenicura*, subsp. a *A. insularis* Sharpe, *Cat. B.* vol. xxiii p. 162 (1894—Andamanen und Nicobaren).

Kopffärbung wie bei der typischen Form, aber Brust und Unterkörper sind bis auf einen ziemlich schmalen weissen Medianstreif grauschwarz, während die schwarzgraue Färbung bei den übrigen Formen im wesentlichen auf die Flanken beschränkt zu sein pflegt und vom angelegten Flügel der Hauptsache nach verdeckt wird.

Verbreitung: Andamanen und Nicobaren.

## XXIII. Die Formen von *Baza subcristata* (Gould).

### Übersicht (Alterskleid).

A. Kehle und Kropf blass aschgrau, Querbinden des Unterkörpers im extremsten Falle dunkel braungrau, meist aber rötlich braun und in der Regel ziemlich schmal; Grundton der Federn des Unterkörpers weisslich oder isabellfarben.

- |   |       |                             |
|---|-------|-----------------------------|
| a. Flügelänge: ♂ 325—328, ♀ 332—347 mm. | . . . | <i>B. s. subcristata.</i>   |
| b. Flügelänge: ♂ 295—306, ♀ 310—327 mm. | . . . | <i>B. s. timorlaeönsis.</i> |
| c. Flügelänge: ♂ 286—295, ♀ 300—314 mm. | . . . | <i>B. s. pallida.</i>       |

B. Kehle und Kropf dunkler aschgrau, Querbinden der Unterseite in extremen Fällen schwarz, meist aber grauschwarz oder braunschwarz und in der Regel breiter als bei den Formen der Gruppe A.

- |  |       |                           |
|--|-------|---------------------------|
| a. Unterflügeldecken heller oder dunkler rostfarben. |       |                           |
| 1. Flügelänge: ♂ 279—298, ♀ 302—312 mm.              | . . . | <i>B. s. reinwardtii.</i> |
| 2. Flügelänge: ♂ 300—306, ♀ 322—334 mm.              | . . . | <i>B. s. megala.</i>      |
| b. Unterflügeldecken weiss oder blass isabellfarben. |       |                           |
| 1. Flügelänge: ♂ 289—300, ♀ 310—321 mm.              | . . . | <i>B. s. gurueyi.</i>     |
| 2. Flügelänge: ♂ 309—312, ♀ 317—330 mm.              | . . . | <i>B. s. bismarcki.</i>   |

C. Kehle und Kropf aschgrau, auch bei ausgefärbten Exemplaren stark rostfarben verwaschen; Querbinden des Unterkörpers fuchsrot auf hell röstlichem Grunde . . . . . *B. s. rufa*.

### 1. *Baza subcristata subcristata* (Gould).

*Lepidogenys subcristatus* Gould, *Synops. Birds Austr.* vol. iii t. 46 (1838—N. S. Wales).

Flügelänge in mm.:

♂ 325, 326, 328; ♀ 332\*, 334, 335\*, 335\*, 336\*, 340\*, 343\*, 347\*.

*Verbreitung*: Australien.

### 2. *Baza subcristata timorlaoënsis* A. B. M.

*Baza timorlaoënsis* A. B. Meyer, *Abh. Ber. Zool. Mus. Dresden* 1892-3 No. 3 p. 5 (1894—Timorlaut).

Flügelänge in mm.:

[Timorlant (Mus. Dresden): ♂ 285 (juv.), 297 (juv.)]

Damar: ♂ 304.

Babbar: ♀ 315.

Timor: ♂ 296\*, 297.

Sumba: ♂ 300\*. ♀ 310, 324\*, 327.

Flores: ♂ 295\*, 301, 305, 306.

Lombok: ♀ 310.

Djampea: ♀ 324.

Kalidupa: ♀ 312.

*Verbreitung*: Inselkette von Timorlant bis Lombok; Djampea, Bonerate (?), Kalidupa.

Es sind bisher von der typischen Localität nur zwei unausgefärbte Stücke bekannt geworden. Da sich indessen zwischen ausgefärbten Exemplaren aus Babbar und Damar einerseits und solchen von Flores und Lombok andererseits keine subspezifischen Differenzen herausstellen, so liegt bei den nahen zoogeographischen Beziehungen Babbars zu Timorlaut der Schluss nahe, dass die letztere Insel keine ihr eigentümliche Form beherbergt.

### 3. *Baza subcristata pallida* subsp. n.

In der Färbung wie die vorigen Formen, aber kleiner.

Flügelänge in mm.:

Kei-Inseln: ♂ 286, 294, 295.

Goram: ♀ 300, 303, 304, 314.

*Typus*: ♂ Tual (Kei-Inseln), 10. iv. 1900, H. Kühn coll., im Tring-Museum.

*Verbreitung*: Kei- und Südost-Inseln.

### 4. *Baza subcristata reinwardtii* (Müll. & Schleg.).

*Falco (Lophotes) Reinwardtii* Müller & Schlegel, *Verh. Ned. Overz. Bezitt. Zool. Aves* p. 35 f. 2 (1843—Celebes! Borneo!) Patr. subst.: Ambon.

Flügelänge in mm.:

Ceram: ♂ 279, 288, 289, 292, 292, 294, 296\*, 298\*.

♀ 304, 310.

Ambon: ♂ 283, 290\*, 292, 292, 295, 297.

♀ 305\*, 308, 312.

Buru: ♂ 292.  
♀ 302\*.

Verbreitung: Ceram, Ambon, Buru.

5. *Baza subcristata megala* subsp. n.

In der Färbung ganz mit *B. s. reinwardtii* übereinstimmend, aber grösser.

Flügelänge in mm.:

Fergusson-Insel: ♂ 300, 306\*.

♀ 322, 334.

Typus: ♀ Fergusson-Insel, 16. vi. 1897, A. S. Meek coll. No. 627, im Tring-Museum.

Verbreitung: Fergusson-Insel und wahrscheinlich auch die übrigen Inseln des D'Entrecasteaux-Archipels.

*Baza subcristata megala* > *reinwardtii*.

Exemplare von Südost-Neuguinea sind im Durchschnitt grösser als solche aus dem Niederländischen Teil der Insel und den Südmolukken, scheinen indessen die Dimensionen der Fergusson-Stücke nicht zu erreichen.

Flügelänge in mm.:

Brit. Neuguinea: ♂ 298, 300, 303, 310\*.

♀ 313, 315, 318, 321.

*Baza subcristata megala* < *reinwardtii*.

Die von mir untersuchten Vögel aus Niederländisch Neuguinea, Misol und Salawatti sind im Durchschnitt um ein geringes grösser als solche von den Südmolukken, aber kleiner als Exemplare aus dem Britischen Gebiet.

Flügelänge in mm.:

Niederl. Neuguinea: ♂ 291, 293, 294, 296, 299, 300.

♀ 303, 306\*, 307, 308, 313.

Misol: ♂ 297.

Salawatti: ♂ 289.

♀ 306.

Zwei ♀♀ des Tring-Museums von Waigeu scheinen sich in der Tönung der Unterseite und in der Grösse der Form *B. s. rufa* zu nähern: Flügel 312 und 319 mm. Das Bestehen von Übergangsstufen zwischen *reinwardtii* und *rufa* auf den zwischen Halmahera und Neuguinea gelegenen Inseln und im westlichsten Teil Neuguineas selbst nahm bereits A. B. Meyer in *Abh. Ber. Zool. Mus. Dresden*, 1892-3, No. 3 p. 4 an.

Van Oort stellt in *Nova Guinea* vol. ix Zool. pp. 56, 57, zwei vom Sammler als ♀ bezeichnete Exemplare vom Noord-River mit der Flügelänge 293 und 284 mm. (also offenbar ♂♂!) zu

[*Baza reinwardtii stenozona* G. R. Gray]

*Baza stenozona* G. R. Gray, *P. Z. S.* 1858 pp. 169, 189 (Aru)

*Baza reinwardtii stenozona* (laps. cal.), Berlepsch, *Abh. Senckenb. Nat. Ges.* vol. xxxi 1911 p. 81

mit der Begründung: "The principal differences between this subspecies and the true *B. reinwardtii* are the smaller dimensions and the somewhat narrower

bands across the breast." Ich selbst habe von den Arn-Inseln nur drei Exemplare gesehen, alles junge Vögel, darunter den im Brit. Museum befindlichen Typus von *stenozona*, und kann daher über die Berechtigung dieser Form und ihre Beziehung zu Stücken von Niederl. Neu-Guinea kein Urteil abgeben; es ist mir indessen wahrscheinlich, dass letztere der gleichen Form angehören wie Aruvögel—aber nicht durch die Merkmale charakterisiert sind, welche van Oort hervorhebt: denn schmale Bänderung und geringe Grösse bei Neuguinea-Stücken deuten zweifellos auf junge Vögel hin. Ausgefärbte Exemplare aus der Gegend des Schneegebirges sind mit sehr breiten und sehr dunklen Querbinden auf der Unterseite versehen.

Graf Berlepsch gibt als Flügelmass zweier Aruvögel an: " ♂ 282.5, ad. 304." Das erstgenannte Stück trägt vermutlich noch das infantile Grossgefieder (derartige Exemplare sind bei meinen Messungen i. a. nicht berücksichtigt), während das zweite ein ♀ sein dürfte.

Man wird vorläufig am besten tun, die zweifelhafte Form *Baza stenozona* fallen zu lassen und die Aruvögel mit der gleichen Formel zu bezeichnen, wie sie sich für Serien aus Holländisch Neuguinea ergibt.

#### 6. *Baza subcristata gurneyi* Rams.

*Baza gurneyi* Ramsay, *Journ. Linn. Soc. Zool.* vol. xvi p. 130 (1881—Salomons-Inseln).

Flügelänge in mm.:

♂ 289, 290, 294, 295, 295, 296, 299, 299, 300.

♀ 310, 313, 319, 321.

*Verbreitung*: Salomons-Inseln.

#### 7. *Baza subcristata bismarcki* Sharpe.

*Baza bismarcki* Sharpe, in Gould's *Birds New Guinea* vol. i t. 4 (1888—Bismarck-Archipel).

Flügelänge in mm.:

♂ 309, 310\*, 312\*.

♀ 317 (Mus. Dresden), 330.

*Verbreitung*: Bismarck-Archipel.

#### 8. *Baza subcristata rufa* Schl.

*Baza rufa* Schlegel, *Vog. Ned. Ind. Valkvog.* pp. 41, 78; t. 27 f. 4, t. 28. ff. 1-3 (1866—Halmahera, Morotai, Batjan, Ternate, Tidore).

Ausser durch die in der Übersicht angegebenen Färbungscharaktere anscheinend auch durch etwas bedeutendere Grösse von *B. s. reinwardtii* unterschieden.

*Verbreitung*: Nord-Molncken, Obi.

*Ann.*: In vielen Fällen stimmt die Angabe des Geschlechtes auf der Etikette nicht mit meiner Wiedergabe in den obigen Masstabellen überein; ich habe ausnahmslos die kleineren Individuen als ♂, die grösseren als ♀ aufgeführt und bin überzeugt, dass zuverlässige Geschlechtsbestimmungen den angenommenen sexuellen Grösseunterschied bestätigen werden.



XXIV. Die Formen von *Cinnyris clementiae* Less.

## Übersicht (♂).

A. Schnabel (vom Beginn der Stirnbefiederung an in gerader Linie gemessen) über 18 mm. lang :

- a. Brustfedern ohne dunkel rostfarbene Spitzen . *C. clementiae clementiae*.  
 b. Brustfedern mit dunkel rostfarbenen Spitzen . *C. clementiae keiensis*.

B. Schnabel unter 18 mm. lang :

- a. Oberseite hell oliv . . . . . *C. clementiae buruensis*.  
 b. Oberseite düster braun . . . . . *C. clementiae teysmanni*.

1. *Cinnyris clementiae clementiae* Less.

*Cinnyris clementiae* Lesson, *Dict. Sc. Nat.* vol. 50 p. 18 (1827—Soya auf Ambon).

*Cinnyris zenobia* Lesson, *Voy. Coq. Zool.* vol. i p. 679 ; t. 30 f. 3 (1830—Ambon).

*Cyrtostomus melanogastra* Gray, *Handl. B.* vol. i. p. 112 (1869—Ceram). *Nomen nudum* !

Da die Beschreibung von *C. zenobia* nicht 1826, sondern erst 1830, die Tafel wahrscheinlich noch später erschienen ist (vergl. Sherborn & Woodward, *Ann. & Mag. Nat. Hist.* (7) vii, 1901, p. 391), so hat der Name *C. clementiae* die Priorität. Zwar citiert Lesson hierzu bereits im Jahre 1827: tab. 30, fig. 2 (*Zool. de la Coquille*), doch dürfte dieses Citat die Annahme bekräftigen, dass die Tafel damals noch nicht publiciert war, sondern nur im Original und noch ohne Namensbezeichnung vorlag. Bei ihrer Drucklegung wurde die Manuskriptnummerierung der vier auf t. 30 abgebildeten Vögel offenbar geändert, da "*Cinnyris zenobia*" der veröffentlichten Tafel die Nummer 3 trägt. Eine fast wörtliche Wiedergabe der Originalbeschreibung findet sich in Lessons *Man. d'Orn.* ii (1828) p. 40.

Bei dieser Form treten im männlichen Geschlecht niemals grünlichblau-metallische Spitzen an den Federn von Stirn und Vorderkopf auf; rostbraune Enden der Brustfedern, als untere Begrenzung des blaumetallischen Halsschildes, fehlen meist völlig; nur selten ist eine geringe Spur dieser Färbung wahrzunehmen.

Flügelänge in mm. :

Ambon : ♂ 50·5, 51, 51, 51, 52, 52, 53·5.

♀ 48, 49.

Ceram : ♂ 49·5, 50, 50, 50, 51, 51, 51, 51, 51·5.

♀ 46.

Schnabellänge in mm. (♂♂ ad.) :

Ambon : 19, 19, 19·5, 19·5, 20.

Ceram : 18, 18, 18·8, 19, 19, 19, 19, 20.

*Verbreitung* : Ceram, Ambon, Saparua, Nusa Laut.

2. *Cinnyris clementiae keiensis* subsp. n.

Subspezifische Merkmale : ♂ ad. : Brustfedern in frischem Gefieder mit breiten, dunkel rostfarbenen Spitzen ; Federn von Stirn und Vorderkopf mit meist breiten grünlichblau reflektierenden Spitzen ; ♀ ad. : Unterseite etwas fahler gelb als bei der typischen Form.—Flügelänge im Durchschnitt etwas beträchtlicher als bei Ceram- und Ambon-Exemplaren.

Flügelänge in mm. :

Kei-Inseln : ♂ 51, 51·5, 52, 52, 52, 52, 53, 53, 53, 53, 53.

♀ 49, 50, 50.

Schnabellänge in mm. ( ♂♂ ad.):

Kei-Inseln: 18, 18·5, 19, 19, 19, 19, 19·3, 20, 20.

Typus: ♂, Add (auf Gross-Kei = Nuhu Jud), 9. vii. 1900, H. Kühn coll. No. 2792, im Tring-Museum.

Verbreitung: Kei-Inseln.

### *Cinnyris clementiae clementiae* ≤ *keiensis*.

Vögel von Ceramlaut, Goram und den Watubela-Inseln sind intermediär; sie zeigen meist deutliche Spuren des rostfarbenen Brustbandes und kleine metallische Spitzen an den Stirnfedern. Die Flügellänge ist bedeutender als bei der typischen Form, scheint durchschnittlich sogar die der Keivögel zu übertreffen.

Flügellänge in mm.:

Ceramlaut: ♂ 52, 52·5, 53, 53, 53, 54.

♀ 50, 50.

Goram: ♂ 52, 52, 53, 53·5.

Teor: ♂ 53, 53, 53·5, 53·5, 54, 54·5, 55·5.

♀ 50.

Schnabellänge in mm. (♂♂ ad.):

18·5, 18·8, 19, 19, 19, 19, 19, 19·3, 19·8, 20.

### 3. *Cinnyris clementiae buruensis* Hart.

*Cinnyris zenobia buruensis* Hartert, Bull. B. O. Club vol. xxvii p. 12 (1910—Buru).

Ganz wie die typische Form, aber mit wesentlich kürzerem Schnabel. Rostfarbene Federspitzen in der Brustregion fehlen stets, blau metallische Enden der Stirnfedern zeigt nur eines der untersuchten ♂♂.

Flügellänge in mm.:

♂ 49, 50, 50, 50·5, 51, 51, 51, 51, 51, 51·5, 51·5, 52.

♀ 47, 47·5, 48, 48, 49.

Schnabellänge in mm. (♂♂ ad.):

15·8, 16, 16, 16, 16, 16, 16·5, 17, 17.

Verbreitung: Buru.

### 4. *Cinnyris clementiae teysmanni* Büttik.

*Cinnyris teysmanni* Büttikofer, Not. Leyd. Mus. vol. xv p. 179 (1893—"Makassar"). Patr. subst.: Djampea od. Kalao, cf. Hartert, Nov. Zool. 1896 p. 168.

*Cinnyris teysmanni* scheint mir durchaus dem Formenkreis von *C. clementiae* anzugehören. Sie hat mit der Buruform den kurzen Schnabel, mit der Keiform das dunkel rostfarbene Brustband gemeinsam. Jüngere Stücke zeigen eine ausgesprochen olivfarbene Tönung der Oberseite, die beim ausgefärbten Vogel einem düsteren Braun weicht.

Flügellänge in mm.:

Kalao: ♂ 53, 53·2, 54; ♀ 49, 50.

Djampea: ♂ 53, 54.

Schnabellänge in mm. (♂♂ ad.):

17, 17, 17·2, 17·2, 18.

Verbreitung: Djampea und Kalao.

XXV. Die Formen von *Macropygia ruficeps* (Temm.).*Macropygia ruficeps ruficeps* (Temm.)

*Columba ruficeps* Temminck, *Pl. Col.* t. 561 (1834—Java, Sumatra; patr. restr.: Java).

Finsch hat in *Not. Leyd. Mus.* vol. 26 p. 137 dargetan, dass die bisher mit der typischen *M. ruficeps* vereinigten Vögel von Sumatra und Borneo sich durch die bei alten Stücken regelmässig dunkle Kropffleckung unterscheiden, während diese Zeichnung bei alten Javanern fehlt.

Die Kropf- oder Brustfeder eines völlig ausgefärbten Stückes von *M. r. ruficeps*, mit grün- resp. weinrot-metallischen Spitzen der Nackenfedern, besitzt folgende Färbung (fig. B):



FIG. A.



FIG. B.

Ein ziemlich breiter Endsaum reinweiss; es folgt nach der Basis zu eine etwas breitere, fahl rötlich braune Zone, die ganz allmählich in eine lichtgraue übergeht. Etwa die gleiche Färbung findet sich an den entsprechenden Federn alter Stücke von *M. r. orientalis* und *assimilis*.

Die Vögel von Borneo, Malacca und Sumatra sind im Gegensatz zu Finsch's Vermutung mit der letztgenannten Form nicht ident und müssen einen eigenen Namen erhalten, als welchen ich

*Macropygia ruficeps nana* subsp. nov.

vorschlage.

*Typus*: ♂, Kina Balu in Nord-Borneo, 22. iii. 1888, J. Whitehead coll., im Tring-Museum.

Charakteristisch für diese Form ist neben der geringen Durchschnittsgrösse die folgende Färbung der Kropf- und Brustfedern beim adulten Vogel (fig. A): Endsaum reinweiss, basalwärts begrenzt durch eine hellrostfarbene Zone von der Gestalt eines Dreiecks, dessen Basis auf dem weissen Endsaum aufruht und dessen beide andere Seiten flankiert sind von einer breiten schwarzen Zone, die den Federgrund einnimmt und sich dann gabelt, nach vorn und aussen an Schwärze zunehmend.—Junge Exemplare von *M. r. nana* kennzeichnen sich vor solchen der drei übrigen Formen durch schwarzen, nicht dunkelgrauen oder schwarzgrauen Grund der Kropf- und Brustfedern; letzteren mangelt in diesem Kleide bei allen Formen ein weisser Endsaum.

Flügelänge in mm.:

*M. r. ruficeps*: Java: 140\*, 140\*, 142\*, 143, 149\*.

Bali: 146, 146.

Lombok: 150.

8 Ex.: Durchschnitt 144.5, Variation 140—150 mm.

*M. r. nana* : Borneo : 127, 131, 131, 131, 131\*, 132, 133\*, 135\*, 135\*, 136, 137, 137\*, 137\*, 138, 138\*, 138\*, 139\*, 140, 148\*.  
Sumatra : 135, 135, 138, 140\*, 141\*, 142\*, 144, 144, 148.  
Malacca : 135\*, 135\*, 135\*, 137, 138\*, 138\*, 139\*, 140, 141, 142, 142, 143.  
40 Ex. : *Durchschnitt* 137·7, *Variation* 127—148 mm.

***Macropygia ruficeps orientalis* Hart.**

*Macropygia ruficeps orientalis* Hartert, *Nov. Zool.* vol. iii p. 573 (1896—Sumbawa).

Im Färbungscharakter ähnlich der typischen Form, aber Unterschwanz- und Unterflügeldecken in der Regel etwas dunkler; das wesentlichste subspezifische Merkmal besteht in der bedeutenderen Grösse.

Flügelänge in mm. :

Sumbawa : 152, 159.

Flores : 146\*, 147, 154, 157\*, 158, 160, 161, 162, 162\*.

Pantar : 167.

12 Ex. : *Durchschnitt* 157·0, *Variation* 146—167 mm.

*Verbreitung* : Pantar, Flores, Sumbawa, vielleicht auch Lombok.

***Macropygia ruficeps assimilis* Hume.**

*Macropygia assimilis* Hume, *Str. Feath.* vol. ii p. 441 (1874—Tenasserim).

In der Färbung sehr ähnlich der annähernd gleichgrossen *M. r. ruficeps*, aber unterseits gewöhnlich etwas blasser, insbesondere das Kinn stets weisslicher. Blasser und durchschnittlich kleiner als *M. r. orientalis*.

Flügelänge in mm.

Burma : 139, 140\*, 143\*, 144\*, 146\*, 147\*, 148\*, 149, 149\*, 149\*, 152, 153.

12 Ex. : *Durchschnitt* 146·6, *Variation* 139—153 mm.

*Verbreitung* : Burma und Tenasserim.

**XXVI. Die Formen von *Alcedo ispida* im östlichen und südlichen Asien und dem indo-australischen Archipel.**

Die Untersuchung zweier Exemplare aus Bali, die bisher der Form *Alcedo ispida bengalensis* zugeteilt worden waren, veranlasste mich, Stücke aus allen Teilen des Verbreitungsgebietes dieser Subspecies, so wie es von Hartert in *Vög. pal. Fauna* vol. ii p. 883 umgrenzt worden ist, zu vergleichen und führte schliesslich zu einer Revision der ganzen Gruppe östlicher und südlicher Vertreter an der Hand des enormen Materials, das sich im Tring-Museum und im British Museum angehäuft hat.

Es zeigte sich hierbei, dass wir es vom "östlichen Sibirien bis nach Indien und den grossen Sunda-Inseln" nicht mit einem einheitlichen Complex zu tun haben, dass vielmehr die Form in Malakka, Borneo, Sumatra, den Andamanen und Nicobaren, Tenasserim, Burma, Siam, Hainan, Mittel- und Südchina, Assam und Bengalen am kleinsten ist, von diesem Gebiet aus nach Norden, Osten und Westen

zu dagegen grösser wird, so zwar, dass die Grössenzunahme der Form längs der pacifischen Küste Asiens mit Einschluss der vorgelagerten Inseln eine offenbar sehr allmähliche, nach N.W. zu dagegen eine sehr rasche ist; die Vögel erreichen hier bereits im Indus-gebiet und dem westlichen Himalaya die für *Alcedo ispida pallasii* Rehb. charakteristische Flügellänge und müssen mit diesem Namen bezeichnet werden. Es wurde dies bereits von Hume in *Stray Feathers* vol. I p. 168 hervorgehoben, als er auf die *Alcedo ispida*-Form von Sindh zu sprechen kam: "In size this bird is so conspicuously larger than the common *bengalensis*, that the difference cannot fail to strike the most casual observer, and this coupled with the much shorter bill compels me to identify it with *ispida* rather than *bengalensis*."

In Vorderindien scheint *Alcedo ispida* eine zwischen *pallasii* und *bengalensis* intermediäre Durchschnittsgrösse zu erreichen; gleichzeitig findet man an der Küste des südlichsten Gebietes zuweilen oberseits sehr lebhaft und dunkel bläulich gefärbte Stücke, die zu der kleinen Ceylonform *A. i. taprobana* überleiten.

Ob die nordostasiatischen Stücke, einschliesslich der von Formosa, den Lutschu-Inseln und Japan, als *A. i. pallasii* bezeichnet werden dürfen, wie sich aus ihrer beträchtlichen Flügellänge entnehmen liesse, muss die Vergleichung ihrer Färbung und Schnabelform mit topotypischen (westsibirischen) Exemplaren von *pallasii* ergeben.

Den folgenden Angaben der Flügellänge liegt das Balgmateriale des Tring-Museums (Zahlen ohne Stern) und des British Museum (Zahlen mit Stern) zu Grunde.

#### *Alcedo ispida bengalensis* Gm.

Bengalen: 68·5\*, 69\*, 69·5\*, 70\*.

Assam: 69\*, 69\*, 69\*, 70·5\*, 71\*, 71\*, 71\*, 72\*, 72\*.

Burma und S. Shan-Staaten: 67, 67\*, 67\*, 67\*, 67\*, 67\*, 68, 68, 68, 68, 68\*, 68\*, 68·5, 68·5\*, 68·5\*, 69\*, 69\*, 69\*, 69\*, 69\*, 69\*, 69\*, 69\*, 69·5\*, 69·5\*, 69·5\*, 70, 70, 70\*, 70\*, 70\*, 70\*, 70\*, 70\*, 70·5\*, 70·5\*, 71\*, 71\*, 71·5\*, 72\*, 72\*, 72\*.  
*Durchschnitt* von 43 Ex.: 69·2 mm.

Yunnan: 67, 71.

Tenasserim: 67, 67\*, 67·5\*, 67·5\*, 68·5, 69\*, 69\*, 69\*, 70, 70\*, 70\*, 71\*, 71\*, 71·5\*, 71·5\*.

Salanga: 66·5\*, 70·5\*, 71·5\*.

Malakka und Singapore: 67\*, 67\*, 68\*, 68\*, 69\*, 69\*, 69\*, 70, 70\*, 70\*, 70\*, 70\*, 70\*, 70\*, 70\*, 70·5\*, 71, 71\*, 72\*, 73\*. *Durchschnitt* von 20 Ex.: 69·7 mm.

Andamanen: 67, 68\*, 68\*, 70\*, 70\*, 71, 71\*, 72\*, 72\*, 72, 73.

Nikobaren: 68\*, 68·5\*, 69, 70\*, 71.

Borneo und Labuan: 68, 69\*, 69\*, 70\*, 71\*.

Sirhassen: 68.

Siam: 70\*, 70·5\*, 71\*.

Tonkin: 68, 71.

Hainan: 67, 68, 68, 68·5, 68·5, 69, 69\*, 70, 70·5, 71, 71, 71·5, 72, 72·5.

*Durchschnitt* von 14 Ex.: 69·7 mm.

Amoy: 68\*, 68\*, 69\*, 70\*, 70\*, 71\*, 71\*, 71·5\*, 72\*, 74\*.

Futschou: 67\*, 69\*, 69\*, 70\*, 70\*, 70\*.

Schanghai: 68·5, 70\*, 70, 72\*.

Tai-pai-shan (Tsin-ling-Geb.): 71\*, 71\*, 72\*, 72\*.

*Grössere nordöstliche Form.*

Philippinen: 69, 69, 69, 70, 70, 70\*, 70\*, 70\*, 70, 70·5, 70·5, 71, 71, 71\*, 71\*, 71·5\*, 71·5\*, 71·5, 72\*, 72\*, 72\*, 72\*, 72\*, 73\*, 75\*. *Durchschnitt* von 25 Ex.: 71·0 mm.

Formosa: 69\*, 70, 70, 70\*, 70\*, 70·5\*, 71, 71\*, 71·5, 72, 72, 72, 72, 72\*, 72·5, 72·5, 72·5, 72·5, 72·5, 73, 73, 73, 73, 73\*, 73·5, 74, 74\*, 74·5\*, 74·5\*, 76, 76·5. *Durchschnitt* von 32 Ex.: 72·4 mm.

Okinawa-schima: 69, 69·5\*, 70, 70·5, 70·5, 71, 71, 71, 71, 71, 71, 71·5, 72, 72·5, 73, 73, 73\*. *Durchschnitt* von 17 Ex.: 71·2 mm.

Amami-o-schima: 71, 71, 71, 72, 72, 73, 73, 73·5, 73·5, 74, 74.

Tanega-schima: 70·5, 72, 72·5, 74, 74·5, 75.

Kiu-Schiu: 73, 73·5.

Amur-bai: 69\*, 70\*, 70·5\*, 71\*, 71, 73\*, 73\*, 74·5\*.

**Alcedo ispida pallasii** Rehb.

Gebiet des Indus und seiner Zuflüsse vom Pundjab bis Sindh: 69\*, 71\*, 72\*, 72\*, 72\*, 73\*, 73\*, 73\*, 73\*, 74\*, 74\*, 74\*, 74\*.

Kaschmir: 70\*, 71\*, 72\*, 72\*, 73\*, 74\*.

Yarkand: 73·5, 74.

Ala Kul (Turkestan): 73·5.

Kandahar (Afghanistan): 72\*, 74\*, 75·5\*, 76\*.

*Durchschnitt* von 26 Ex.: 72·8, *Variation* 69—76 mm.

**Alcedo ispida bengalensis**  $\leq$  **pallasii**.

Bhutan und Sikkim: 68, 68\*, 68\*, 68·5, 70, 70\*, 71\*, 72\*, 72·5, 75·5.

Nepal: 68·5\*, 69\*, 72\*, 75·5\*.

Centraler Himalaya: 71\*, 72\*, 73·5\*.

Nord-West-Provinzen: 69\*, 69·5\*, 71\*, 72\*, 72·5\*.

**Alcedo ispida bengalensis**  $\leq$  **taprobana**  $\leq$  **pallasii**

Madras: 68·5\*, 71\*, 71\*, 72\*.

Mysore: 69\*, 71\*, 71\*, 71\*, 75.

Travancore: 68\*, 69\*, 71\*, 71\*.

Gegend von Bombay: 68\*, 69\*, 72\*, 72\*.

Belgaum: 68\*, 70\*, 71\*, 72\*, 72\*, 73\*.

**Alcedo ispida taprobana** Kleinschm.

*Alcedo ispida*, var. *taprobana* Kleinschmidt, *Orn. Mber.* vol. ii p. 126 (1894—Ceylon).

Die ceylonesische ist die kleinste aller bisher bekannten Formen; sie ist in der Regel auf Rücken und Bürzel von viel lebhafterem Blau, als es bei *A. i. bengalensis* die Norm ist, und ähnelt dann im Farbton sehr der *A. i. floresiana*, die indessen in allen Teilen grösser ist, und bei der die Deckfedern der Scapularen meist weniger grünlich sind. Es kommen vereinzelte Stücke auf Ceylon vor, die in der Färbung mit *A. i. bengalensis* ganz übereinstimmen, wie solche gleichfalls aus dem Wohngebiet von *A. i. hispidoides* bekannt geworden sind; doch müssen

dieselben offenbar als Variationen—Rückschläge zum Festlandstypus—nicht als Vertreter einer anderen Form aufgefasst werden.

Flügelänge in mm. :

Ceylon : 65·5, 66, 67, 67, 67, 67, 67\*, 67\*, 67·5, 67·5, 67·5, 68, 68, 68, 68\*, 68·5, 69, 69, 69\*, 69·5, 69·5\*, 70, 71·5.

Durchschnitt von 24 Ex. : 68·0 mm.

Verbreitung : Ceylon.

### **Alcedo ispida floresiana** Sharpe.

*Alcedo ispida*, subsp. *a* *A. floresiana* Sharpe, *Cat. B.* vol. xvii p. 151 (1892—Flores).

Oberseits sehr lebhaft blau, dunkler und viel weniger grünlich als normale Exemplare von *A. i. bengalensis*; hierin und in der bedeutenderen Durchschnittsgrösse vollkommen mit *A. i. hispidoides* übereinstimmend, die sich wiederum durch die für gewöhnlich bläulichen oder schwärzlichen, nicht rotbraunen Wangen und Ohrdecken unterscheidet.

Flügelänge in mm. :

Bali : 71, 72.

Sumbawa : 69·5.

Flores : 67, 69, 69\*, 70\*, 71\*, 71\*, 75\*.

Alor : 69, 69, 70, 70\*, 71\*, 72, 72\*.

Wetter : 72·5, 73, 73, 73·5.

Timor : 67, 70·5, 71, 71.

Sumba : 71\*, 71·5, 73, 73, 73·5.

Romah : 71, 72, 72·5, 73, 74, 76.

36 Ex. : Durchschnitt 71·4, Variation 67—76 mm.

Verbreitung : Bisher nur von den oben aufgeführten Inseln nachgewiesen.

### **Alcedo ispida hispidoides** Less.

*Alcedo hispidoides* Lesson, *Compl. de Buff.* vol. ix p. 345 (1837—Buru).

In der Färbung mit *A. i. floresiana* übereinstimmend, nur sind die Wangen und Ohrdecken, anstatt rötlichbraun, in der Regel schwärzlich oder dunkelbläulich gefärbt.

M. in der folgenden Masstabelle = nach Meyer & Wiglesworth, *The Birds of Celebes*, vol. i p. 265.

Flügelänge in mm. :

Djampea : 70·5.

Kalidupa : 71·5, 72, 72, 73, 73·5.

Saleyer : 71, 72.

Buton : 70·5, 74, 75.

Süd-Celebes : 70, 72, 74, 74.

Nord-Celebes : 71\*, 72, 72·5, 73, 74\*, 74·5, 75.

Siao : 73·5.

Peling : 73.

Buru : 71·5\*, 72, 74.

Ambon : 68·5, 69, 69, 69·5, 69·5, 70, 70\*.

Ceram : 68·5, 70, 74 [M].

Goram : 70, 71, 71, 71.

Watubela : 75 [M].

Teoor: 75.

Obi: 71, 74, 75.

Batjan: 70, 71, 72, 74.

Neu-Pommern: 69\*, 71\*, 71\*, 74 [M].

Neu-Lauenburg: 72\*, 72\*, 73.

57 Ex.: *Durchschnitt* 71·9, *Variation* 68·5—75 mm.

*Verbreitung*: Ausser von den oben aufgeführten Inseln noch nach gewissen von Sangir, Sula-Inseln, Amblau, Banda, Halmahera, Misol und Salawatti.

#### **Alcedo ispida pelagica** subsp. n.

Exemplare vom östlichsten Neu-Guinea (Collingwood- und Milne-Bai) sowie vom D'Entrecasteaux- und Louisiade-Archipel sind durchschnittlich beträchtlich kleiner als typische *A. i. hispidoides*, was mich zu ihrer subspezifischen Abtrennung veranlasst. In der Färbung stimmen sie mit *hispidoides* völlig überein.

Flügelänge in mm.:

Östlichstes Neu-Guinea: 66, 69, 69, 69, 71·5.

Woodlark-Insel: 67, 67·5, 69.

Fergusson-Insel: 66, 68.

St. Aignan: 69, 69·5, 69·5, 70, 70·5, 71.

Südost-Insel: 68, 69, 72.

Rossel-Insel: 69, 69.

21 Ex.: *Durchschnitt* 68·9, *Variation* 66—72 mm.

*Typus*: ♂ St. Aignan, 3. ix. 1897, A. S. Meek coll., im Tring-Museum.

#### **Alcedo ispida salomonensis** Rothschild & Hart.

*Alcedo ispida salomonensis* Rothschild & Hartert, *Nov. Zool.* vol. xii p. 255 (1905—Rendova, Salomons-Inseln).

Alle ausgesprochen blauen Farbtöne der Oberseite sind bei dieser Form noch dunkler und stärker ins Violette spielend als bei *A. i. hispidoides*; gleichzeitig ist die Durchschnittsgrösse bedeutender. Die Vögel von Guadalcanar müssen zweifellos zu *salomonensis* gezogen werden, obgleich ein Exemplar des Tring-Museums von genannter Insel einen Rückschlag zum *hispidoides*-Typ darstellt. Derartige Annäherungen an den weniger spezialisierten Typus finden sich aber vereinzelt bei allen Formen.

Flügelänge in mm.:

Guadalcanar: 74, 75, 75, 75\*, 77\*.

San Christoval: 73.

Gizo: 75, 76.

Vella Lavella: 73·5, 74, 75·5, 76, 77.

Rendova: 73, 74, 74, 74·5, 74·5, 75, 76, 76·5, 77, 77.

23 Ex.: *Durchschnitt* 75·1, *Variation* 73—77 mm.

### **XXVII. Die Formen von *Thriponax javensis* (Horsf.).**

In seinen 1912 (in *Mitt. Zool. Mus. Berlin*, vol. vi) erschienenen "Kritischen Untersuchungen über Piciden" hat Hesse eine Anzahl Vertreter dieser Formen-Gruppe einer näheren, grösstenteils auf das Material des Tring-Museums basierten Revision unterzogen. Er fasst unter dem Artbegriff *Thriponax javensis* die



folgenden Formen zusammen: *Th. j. javensis, parvus* und *suluensis*. Es zeigt sich indessen, dass wir den Kreis noch weiter schlagen und mehrere Formen in ihn hineinbeziehen müssen, die zunächst durch den Besitz eines weissen, nicht schwarzen Unterrückens für eine spezifische Abtrennung hinreichend gekennzeichnet zu sein scheinen; manche Exemplare von *Th. j. javensis* zeigen nämlich eine mehr oder weniger entwickelte Andeutung eines weissen Unterrückenbandes wie bereits Hargitt hervorgehoben hat (*Ibis* 1895 p. 475): "Many examples of *T. javensis* have concealed white feathers both on the lower back and the rump . . . they occur in some specimens of *T. javensis* and not in others from the same locality, regardless of sex and age." Einige Stücke des Tring-Museums bestätigen diese Feststellung vollkommen; sie schlagen die Brücke zu den weissrückigen Formen des Continents und der Philippinen. Vergl. auch Hesse, *l.c.*, p. 176.

Für die folgenden Untersuchungen und Messungen wurde das Material des Tring-Museums (Masszahlen ohne Stern) und des British Museum (Masszahlen mit Stern) benutzt. M = nach McGregor, *Man. Phil. Birds*, vol. i pp. 406-9; H = nach Hesse, *l.c.* p. 175; B = nach Blasius, *J. f. O.* 1890 p. 140.

### Übersicht.

1. Rücken in der Regel einfarbig schwarz, ohne weisse Querbinde auf dem Unterrücken (selten mit der Andeutung einer solchen) . . . . . 2.  
 — Rücken nicht einfarbig schwarz: Unterrücken weiss oder gelblich weiss . . . . . 7.
2. Federn von Kinn und Kehle weiss mit schmalen schwarzen Schaftstrichen, diejenigen von Kropf und Brust schwarz mit breiten blass rahmfarbenen Säumen  
*Th. j. pectoralis*.  
 — Federn von Kinn und Kehle schwarz mit weissen Seitensäumen oder einfarbig schwarz, diejenigen von Kropf und Brust einfarbig schwarz oder schmaler blass rahmfarben gesäumt . . . . . 3.
3. Flügel in der Regel über 220 mm. . . . . *Th. j. javensis*.  
 — Flügel unter 220 mm. . . . . 4.
4. Flügel über 180 mm. . . . . 5.  
 — Flügel unter 180 mm. . . . . *Th. j. parvus*.
5. Oberschnabel von der Stirn an gemessen in der Regel über 50 mm. 6.  
 — Oberschnabel von der Stirn an gemessen unter 50 mm. *Th. j. suluensis*.
6. Die schwarzen Federn von Kropf und Brust in der Regel mit hellen rahmfarbenen Endsäumen; Durchschnittsgrösse bedeutender . . . *Th. j. multilunatus*.  
 — Die schwarzen Federn von Kropf und Brust in der Regel einfarbig ohne helle Endsäume; Durchschnittsgrösse geringer . . . . . *Th. j. confusus*.
7. Die weisse Färbung des Unterrückens weniger ausgedehnt: caudale Hälfte der Bürzelfedern schwarz . . . . . 8.  
 — Die weisse Färbung des Unterrückens ausgedehnter: auch die caudale Hälfte der Bürzelfedern grösstenteils weiss, zuweilen mit schwarzen Flecken . 10.
8. Basis der Handschwingen (meist) ohne oder (seltener) mit einem nur ganz schwach angedeuteten weissen Fleck; Bartstreif des ♂ schmaler . . . *Th. j. hargitti*.  
 — Basis der Handschwingen, wenigstens der ersten und zweiten äusseren, mit wohl ausgebildetem weissem Fleck an der Basis der Innenfahne; Bartstreif des ♂ breiter . . . . . 9.

9. Unterschnabel schwärzlich grau; Durchschnittsgrösse geringer

*Th. j. mindorensis.*

— Unterschnabel hell gelblich; Durchschnittsgrösse bedeutender

*Th. j. philippinensis.*

10. Die weisse Färbung im Basalteil der Innenfahne der Handschwingen erstreckt sich auf über  $\frac{1}{4}$  ihrer Gesamtlänge (mit Ausnahme der beiden äussersten Schwingen) . . . . . *Th. j. feddeni.*

— Die weisse Färbung an der Innenfahne der Handschwingen ist auf einen kleinen Fleck an ihrer Basis beschränkt . . . . . *Th. j. hodgsonii.*

**1. *Thriponax javensis javensis* (Horsf.).**

*Picus javensis* Horsfield, *Trans. Linn. Soc. Lond.* vol. xiii p. 175 (1822—Java).

*Picus leucogaster* Valenciennes ex Reinwardt MS., *Dict. Sc. Nat.* vol. xl p. 178 (1826—Java und Mindanao; patr. restr.: Java).

*Picus horsfieldii* Wagler, *Syst. Av.*, *Picus* sp. 5 (1827—Java).

*Picus fulvigaster* Drapiez, *Dict. Class. d'Hist. Nat.* vol. xiii p. 503 (1828—Java).

Hesse teilt *l.c.* 15, Parrot in seinen *Beitr. Ornith. Sumatra's* 5 Flügelmasse dieser Form mit. Sie bewegen sich i. a. zwischen 225 und 236 mm.; einmal wurde 240 [H], einmal 215.5 [H], einmal 205 [P., Sumatra, ob ausgewachsen?] ermittelt. Der Durchschnitt liegt bei etwa 229 mm.

*Verbreitung*: Süd-Tenasserim, Malakka, Lingga, Natuna, Borneo, Bangka, Sumatra, Java, Bali.

**2. *Thriponax javensis parvus* Richm.**

*Thriponax parvus* Richmond, *Proc. Biol. Soc. Wash.* vol. xv p. 189 (1902—Simalur).

Mit der typischen Form in der Färbung völlig übereinstimmend, aber beträchtlich kleiner. Flügellänge von 12 Exemplaren 166—179 mm. (nach Richmond).

*Verbreitung*: Simalur.

**3. *Thriponax javensis multilunatus* McGreg.**

*Thriponax multilunatus* McGregor, *Philipp. Journ. Sc.* vol. ii p. 285 (1907—Isabela auf Basilan).

Kleiner als die typische Form, und in der Regel—nicht immer—mit auffälligen gelblichweissen Säumen der Kropf und Brustfedern, die zwar zuweilen auch bei *Th. j. javensis* auftreten, hier aber weniger breit zu sein pflegen.

Flügellänge in mm.:

Basilan: ♂ 205\*, 212.5, 212.5, 214\*, 223.

♀ 208\*, 211.5, 218.

Mindanao: ♂ 207\*, 209, 209, 210\*, 210\*, 211, 217.5.

♀ 205, 212\*, 217.

*Durchschnitt* von 18 Ex.: 211.8 mm.

*Verbreitung*: Basilan, Mindanao.

**4. *Thriponax javensis confusus* subsp. n.**

Luzonstücke nehmen eine Sonderstellung ein. Sie unterscheiden sich von *Th. j. javensis*, mit dem sie in der Färbung ganz übereinstimmen, durch die beträchtlich geringere Grösse; von *Th. j. multilunatus* durch das Fehlen heller

Säume an den Kropf und Brustfedern und die etwas kleineren Dimensionen ; von *Th. j. suluensis* durch die bedeutendere Flügellänge und den meist beträchtlich längeren Schnabel ; zudem ist der Unterschnabel dunkelgrau wie bei der typischen Form, nicht gelblich wie bei *suluensis*.

Flügellänge in mm. :

Luzon : ♂ 196·5, 197\*, 204\*, 205\*, 210 [M].

♀ 196, 200 [M], 201 [H], 202\*.

Durchschnitt von 9 Ex. : 202·4 mm.

Schnabellänge (von der Stirn an gemessen) :

Luzon : ♂ 52\*, 52·5\*, 53 [M], 54\*, 55·5.

♀ 47 [M], 53, 53\*.

Bei einem Exemplar findet sich ein grosses Büschel gelbweisser Federn in der Mitte des Unterrückens, das den anderen fehlt.

*Typus* : ♂ Mt. Arayat, Central-Luzon, 21. xii. 1893, J. Whitehead coll., im Tring-Museum.

*Verbreitung* : Luzon.

### 5. *Thriponax javensis suluensis* Blas.

*Thriponax javensis* var. nov. *suluensis* W. Blasius, *J. f. O.* vol. 38 p. 140 (1890—Joló-Sulu).

In der Färbung wie *Th. j. javensis* und *confusus*, aber im Durchschnitt noch kleiner als letzterer, insbesondere der Schnabel kürzer ; Unterschnabel gelblich, nicht dunkelgrau.

Flügellänge in mm. :

Bongao : ♂ 189, 199\*.

♀ 182, 185\*, 195, 201\*.

Tawi-tawi : ♂ 193, 202\*.

♀ 197\*.

Joló-Sulu : ♀ 194.

„ 5 Ex. nach B. : 188—195.

„ 3 ♂♂ nach M. : Durchschnitt 185.

„ 2 ♀♀ „ „ „ 192.

Schnabellänge in mm. (von der Stirn an gemessen) :

Bongao : ♂ 46, 48\*.

♀ 43\*, 46·5, 48\*

Tawi-tawi : ♂ 44·5, 50\*.

♀ 46\*.

Joló-Sulu : ♀ 44·5.

„ 5 Ex. nach B. : 41—45.

„ 3 ♂♂ nach M. : Durchschnitt 45.

„ 2 ♀♀ „ „ „ 42.

*Verbreitung* : Bongao, Tawi-tawi, Joló-Sulu.

### 6. *Thriponax javensis pectoralis* Tweedd.

*Thriponax pectoralis* Tweeddale, *P. Z. S. Lond.* 1878 p. 340—Leyte.

Durch *Th. j. multilunatus* ist diese Form mit *Th. j. javensis* verbunden ; bei jungen Stücken sind die hellen Säume der Kropf- und Brustfedern schmaler als bei adulten, und dieselben sind dadurch dem *Th. j. multilunatus* auffallend ähnlich, doch ist auch bei ihnen die schwarze Färbung an den Kiun- und Kehlfedern auf schmale Schaftstriche beschränkt. Ein mir vorliegendes Exemplar besitzt die Andeutung einer gelbweissen Unterrückenbinde.

Flügelänge in mm.:

Leyte: ♂ 214.

Samar: ♂ 205; ♀ 209.

Verbreitung: Bohol, Leyte, Panaon, Samar.

### 7. *Thriponax javensis hargitti* Sharpe.

*Thriponax hargitti* Sharpe, *Ibis* 1884 p. 317 t. viii—Palawan.

Flügelänge in mm.:

Palawan: ♂ 212\*, 214\*, 214\*, 215\*, 215\*, 216\*, 216\*, 217\*, 218, 220\*, 220.  
♀ 205\*, 206, 208\*, 217.

Durchschnitt von 15 Ex.: 214.2 mm.

Verbreitung: Palawan.

### 8. *Thriponax javensis mindorensis* Steere.

*Thriponax mindorensis* Steere, *List Birds and Mams. Steere Exp.* p. 8 (1890—Mindoro).

Sehr ähnlich *Th. j. hargitti*, aber im Durchschnitt etwas kleiner; durch den Besitz eines meist wohl ausgebildeten weissen Fleckes an der Basis der Innenfahne der beiden äussersten Handschwingen und den etwas schlankeren, an der Basis schmäleren, nicht aber kürzeren Schnabel hinreichend gekennzeichnet; zudem ist die Färbung des Unterschnabels dunkelgrau, nicht gelblich wie bei *hargitti*.

Flügelänge in mm.:

Mindoro: ♂ 201, 202, 204\*; ♀ 201, 206\*, 206\*, 207.

Verbreitung: Mindoro.

### 9. *Thriponax javensis philippinensis* Steere.

*Thriponax philippinensis* Steere, *List Birds and Mams. Steere Exp.* p. 8 (1890—Guimaras und Masbate).

Ähnlich *Th. j. hargitti*, aber der rote Bartstreif des ♂ wesentlich breiter; Innenfahne der beiden äussersten Handschwingen in der Regel mit deutlich ausgebildetem weissem Basalfleck; das Rot der Kopffedern in beiden Geschlechtern dunkler. Von *Th. j. mindorensis* durch den breiteren Bartstreif des ♂ und den gelblichen, nicht dunkelgrauen Unterschnabel unterschieden.

Zuweilen treten—wenigstens bei Exemplaren von Masbate—rote Spitzen an den Federn von Kinn, Kehle, Hals und Oberrücken auf.

Flügelänge in mm.:

Negros: ♂ 202\*, 211, 217. ♀ 200\*, 206.

Masbate: ♂ 214, 217,\* 218\*, 220 [M]. ♀ 218 [M].

Panay: ♂ 205\*.

Guimaras: ♂ 207\*.

Verbreitung: Negros, Guimaras, Panay, Masbate.

### 10. *Thriponax javensis hodgsonii* (Jerd.).

*Hemilophus hodgsonii* Jerdon, *Madr. Journ.* vol. xi p. 215 (1840—Tellicherry).

Verbreitung: Südliches Vorderindien.

11. *Thriponax javensis feddeni* (Blanf.).

? *Picus crawfordii* Gray, in Griffith's *Cur. Anim. Kingd., Birds*, vol. ii p. 513 f. (1829—"from an Indian drawing").

*Mulleripicus feddeni* Blanford, *J. A. S. Beng.* vol. 32 p. 75 (1863—Burma).

*Thriponax jerdoni* Cabanis & Heine, *Mus. Hein.* vol. iv p. 105 (Juli 1863—Ober-Pegu).

*Verbreitung*: Burma, Nord-Tenasserim, Siam, Cochin-China.

XXVIII. Die Formen von *Centropus sinensis* (Steph.).1. *Centropus sinensis sinensis* (Steph.).

*Polophilus sinensis* Stephens, in Shaw's *Gen. Zool.* vol. ix p. 51 (1815—"Said to inhabit China." Patr. (a nobis) design.: Ningpo.).

? *Centropus castanopterus* Stephens, in Shaw's *Gen. Zool.* vol. xiv p. 215 (1826—"India," ex Latham, *Hist. B.* vol. iii p. 243. Latham vereinigt unter gemeinsamem Namen mehrere Formen und gibt als Localitäten Calcutta und den Irawaddy an, der abgebildete Jungvogel dagegen, auf dessen Grösse die anfangs gegebene Beschreibung der Art nicht stimmt, stammt von Cawnpur).

*Centropus fasciatus* Smith, *J. A. S. Beng.* vol. x p. 659 (1841—Gorrucepore-Distrikt).

? *Centrococyx validus* Heine, *J. f. O.* vol. xi p. 357 (1863—Ostindien?).

*Centrococyx maximus* Hume, *Str. F.* vol. i p. 454 (1873—Sindh und Sikkim).

Ich vermag chinesische Exemplare nicht von nord- und nordwest-indischen zu unterscheiden; es ist indessen möglich, dass die Messung grösserer Serien aus China eine etwas geringere Durchschnittsgrösse für den topotypischen *C. s. sinensis* ergibt als für Stücke aus der Indus- und Ganges-Ebene und dem Himalaya. Miteinander gemeinsam haben sie den oberseits grünlich, nicht bläulich schimmernden Schwanz und den relativ kleinen Schnabel; dies sind die wesentlichsten Unterschiede gegenüber der annähernd gleich grossen Form *C. s. bubatus*. Ein weiterer Differenzpunkt zwischen *sinensis* und *bubatus* beruht vielleicht in den bräunlicheren, weniger reinschwarzen und weniger stark glänzenden Unterflügeldecken der ersteren Form.

Flügelänge in mm.:

Ningpo:

♀ 222\*, 225\*.

Futschou: ♂ 210\*, 211, 216, 218.

♀ 222, 222\*, 227.

Hongkong: ♂ 205\*.

♀ 219\*.

Manipur: ♂ 213\*, 213\*, 215\*, 218\*.

♀ 220\*, 220\*, 220\*, 230\*.

Assam: ♂ 203\*, 210\*.

Behar: ♂ 205.

Dacca: ♂ 204.

Bhutan: ♂ 206\*, 208\*, 213\*, 214\*, 215\*.

Sikkim: ♂ 211\*

♀ 220\*.

Kumaon:

♀ 230\*.

Kaschmir: ♂ 210\*.

Lucknow:

♀ 226\*.

Delhi: ♂ 208\*, 210\*, 214\*, 220\*.

♀ 228\*, 237\*, 241\*.

Gurgaon-Distr.: ♂ 218\*.

♀ 222\*, 234\*.

Saharanpur:

♀ 231\*.

Sindh: ♂ 222\*, 222\*, 225\*.

♀ 233\*, 238\*.

*Variation*: ♂ 203—225, ♀ 219—241 mm.

*Verbreitung*: Süd-China, Manipur, Himalaya von Bhutan bis Kaschmir, Assam und nord-indische Tiefebene; Ebene des Indusgebietes.

2. *Centropus sinensis intermedius* (Hume).

*Centrococyx intermedius* Hume, *Str. F.* vol. i p. 454 (1873—Dhoon, Dacca, Thayetmyo; patr. restr.: Thayetmyo).

In der Färbung wie *C. s. sinensis*, also gleichfalls mit oberseits grünlich schimmernden Steuerfedern und braunem, nicht schwarzem Interseapulum, aber im Durchschnitt beträchtlich kleiner.

Flügelänge in mm.:

Salanga: 197\*, 204\* [30 Ex. nach A. Müller: 185—211, Durchschnitt 195.5].

Tenasserim: ♂ 184\*, 186\*, 186\*, 187\*, 187\*, 187\*, 188\*, 188\*, 188\*, 189\*, 190\*, 192\*, 193\*, 193\*, 193\*, 194\*, 194\*, 195\*, 195\*, 195\*, 196\*, 196, 198\*, 198\*.—♀ 200\*, 200\*, 201\*, 201\*, 203\*, 203\*, 206\*, 207\*, 207\*, 207\*, 207\*, 208\*, 215\*, 217\*.

Pegu, Rangoon, Unterlauf des Irawaddy, Sittang- und Salwin-flusses: ♂ 188\*, 191\*, 192\*, 192\*, 193\*, 193\*, 193\*, 194\*, 195, 195\*, 195\*, 196\*, 197\*, 197\*, 198\*, 198, 198\*.—♀ 202\*, 202, 203\*, 207\*, 209\*, 210\*, 219\*.

Arakan: ♂ 187\*, 197\*, 199\*; ♀ 201, 203, 205, 212\*, 214\*, 117.

Kossonum: ♂ 184\*, 185\*, 188\*, 193\*, 193\*, 195\*, 196\*; ♀ 214\*.

S. Yunnan: ♀ 218\*.

S. Chin-hills: ♂ 195. ♀ 215\*.

Cachar: ♂ 197. ♀ 217\*, 218.

Siam: ♂ 197 (Mus. Paris), 199\*.

♀ 200 (Mus. Paris), 211\*, 212 (Mus. Paris), 214\*.

Cambodja: ♂ 188\*.

Cochinchina (Mus. Paris): ♂ 187, 191, 193, 196, 196, 196, 196, 198.

♀ 200, 202, 202, 202, 203, 203, 205, 206, 208, 213.

Tonkin: ♂ 192 (Mus. Paris), ♀ 213.

Hainan: 191, 191, 192\*, 199\*, 200, 200, 201, 203\*, 204, 205, 215, 215, 218.

Variation: ♂ 184—199, ♀ 200—219 mm.

*Verbreitung*: Salanga, nördlichster Teil der malayischen Halbinsel (nördlich bis Paklan), Tenasserim, Siam, Cambodja, Tonkin, Hainan, Yunnan, Burma nördlich bis zu den Chin-hills, Tipperah und Cachar, aber nicht Manipur.

3. *Centropus sinensis bubutus* Horsf.

*Centropus bubutus* Horsfield, *Trans. Linn. Soc. Lond.* vol. xiii p. 180 (1822—Java).

*Centropus philippensis* var. *javanica* Horsfield, *Zool. Research. Java*, Text zu t. 60 (1824—Java).

*Centropus curycereus* Hay, *J. A. S. Beng.* vol. xiv p. 551 (1845—Malakka).

*Centropus borneensis* Bonaparte, *Consp. Vol. Zygod.* p. 5 (1854—nomen nudum!).

*Centrococyx achenensis* Hume, *Str. F.* vol. vi p. 171 (1878—Acheen = Atjeh, N.W. Sumatra).

Diese Form steht der typischen sehr nahe, unterscheidet sich jedoch durch die Färbung der Steuerfedern, deren Oberseite bei adulten Stücken stets bläulich, nicht grünlich glänzt, durch den in der Regel relativ stärkeren, insbesondere höheren Schnabel und durch oft etwas lichterem Braun der Flügel und des Interseapulum. Einige Exemplare von Kangean sind auffällig klein; in der Färbung dagegen stimmen sie ganz mit javanischen überein, und die kleine Serie gestattet noch keine Abtrennung.

Flügelänge in mm.:

Malakka: ♂ 212\*, 218\*; ♀ 223 [M], 227\*, 232\*, 232, 235, 239.

Borneo: ♂ 205, 207, 212\*, 214\*; ♀ 222, 223, 230.

Bunguran: ♂ 216.

Sumatra: ♂ 206\*, 209\*, 210\*, 211\*, 211, 215, 219\*, 221\*, 221\*; ♀ 223\*, 224, 233, 236\*, 238 [P].

Java: ♂ 205, 205, 207, 211; ♀ 217, 220 [P], 220 [P], 228.

Kangean: ♂ 192, 202, 204, 205; ♀ 211, 222 [Vorderman].

Bali: ♀ 215.

Variation: ♂ [192], 202—221; ♀ 211—239 mm.

Verbreitung: Malakka, Bunguran, Borneo, Sumatra, Java, Kangean, Bali.

#### Centropus sinensis subsp.

Exemplare von Palawan stimmen in der Färbung völlig mit der Form *C. s. bubutus* überein, sind jedoch durchschnittlich kleiner, ein Umstand, der zu ihrer subspezifischen Sonderung berechtigen dürfte.

Flügelänge in mm.:

Palawan: ♂ 190 (Mus. Paris), 193 (Mus. Paris), 200\*, 200 (Mus. Paris).

♀ 206\*, 209\*, 217 (Mus. Paris).

Verbreitung: Palawan, Cagayan-Sulu (?), Balabac (?).

#### 4. Centropus sinensis anonymus subsp. n.

Diese Form unterscheidet sich von *C. s. bubutus* durch wesentlich geringere Grösse und viel düstres, ausgesprochener kastanienfarbenes Braun der Flügel und der Interscapularregion, von *C. s. sinensis* durch die gleichen Merkmale und zudem durch den oberseits ausgesprochener bläulich, weniger grünlich schimmernden Schwanz, von *C. s. intermedius* durch bläulichen Schwanz und dunkleres Braun.

Flügelänge in mm.:

Joló-Sulu: ♂ 190 (Mus. Brunsv.), 191 (Mus. Paris); ♀ 199.

Tawi-tawi: ♂ 182, 182 (Mus. Paris).

Typus: Tawi-tawi, Juli 1893, A. Everett coll., im Tring-Museum.

Verbreitung: Tawi-tawi, Joló-Sulu.

#### 5. Centropus sinensis parroti subsp. n.

Auf die auffälligen Merkmale, welche die Ceylon und Vorderindien bewohnende Form von allen übrigen Unterarten des *Centropus sinensis* unterscheiden, haben bereits Lord Walden (*Ibis* 1872 p. 366), Hume (*Str. F.* vol. i p. 435), Blandford (*Birds Brit. Ind.* vol. iii. p. 241), Legge (*Birds of Ceylon* p. 261) u. a. aufmerksam gemacht. Sie bestehen in den folgenden Punkten: (1) Die Interscapularregion ist schwarz mit blaumetallischem Glanz, von der gleichen Färbung wie der übrige Rücken, nicht—wie wir es bei allen übrigen Formen antreffen—kastanienbraun und mit Schwingen, oberen Flügeldecken und Scapularen gleichfarbig. (2) Stirn, Vorderkopf, Kopfseiten und Kinn heben sich durch ihre hellere, leicht grünliche, grünlich schimmernde Färbung von dem Colorit des übrigen, schwarzen Körpergefieders sehr merklich ab, während bei den übrigen Formen im Alterskleid kein Aufhellen des Gefiedertones in diesen Regionen bemerkbar ist. (3) Die metallischen Reflexe an Oberkopf, Nacken und Kehle lassen in der Regel den blauvioletten Einschlag vermissen, der die übrigen Subspecies auszeichnet: Bei Ceylonesen und Vorderindiern sind diese Reflexe von einem ausgesprocheneren Blau, das oft ins grünlichblau oder grünliche übergeht. Schliesslich (4) pflegt das Kastanienbraun der Flügel etwas dunkler zu sein und die innersten Sekundären nehmen oft eine

schwarzgraue Färbung an. Den grünlichen, nicht bläulichen Glanz auf der Oberseite der Stenerfedern teilt die Form mit allen ihren continentalen Vertretern, die geringe Durchschnittgröße nur mit *C. s. intermedius*.

Keiner der Namen, die bisher für die Bezeichnung dieser Form Anwendung fanden, ist in diesem Sinne zulässig: *C. rufipennis* Illiger bezieht sich auf den Philippinenvogel *Centropus viridis*, und unter der Bezeichnung *Centropus castanopterus* Stephens wurden in der Originalbeschreibung die Subspecies *sinensis* und *intermedius* zusammengeworfen.

Ich widme die Form, die ich nunmehr *Centropus sinensis parroti* benenne, dem Andenken Dr. Carl Parrots, der in seinen so überaus sorgfältigen und kritischen "Beiträgen zur Ornithologie Sumatras" von neuem auf die Verschiedenheit ceylonesischer Stücke gegenüber solchen aus dem Archipel hinwies.

*Typus*: Ceylon, E. Ernest Green coll., im Tring-Museum.

Flügelänge in mm.:

Ceylon: ♂ 177\*, 179\*, 180\*, 184, 190, 190 [P], 192\*, 193\*. — ♀ 196\*, 196\*, 197\*, 201\*, 203, 207 [P].

Travancore: ♂ 186\*, 194\*.

Mysore: ♂ 185\*, 191\*.

Ootacamund: 189\*, 191\*, 192\*, 193\*, 195\*, 196\*.

Nilghiri-hills: ♂ 186\*. ♀ 212\*.

Coorg: ♀ 202.

Belgaum: ♂ 185\*, 189\*, 191\*.

Malabar: 186\*, 186\*, 188\*, 188\*, 193\*, 195\*, 197\*, 198\*.

Süd-Konkan: ♂ 182\* ♀ 203\*.

Mhow (Haidarabad): ♂ 189\*. ♀ 205\*.

Ahmednuggar (Maharashtra): ♀ 201\*, 203\*, 203\*, 211\*.

Khandala (Nord-Konkan): ♂ 193\*, 196\*. ♀ 203\*.

Deccan: ♂ 185. ♀ 197\*.

Satpura-hills: ♀ 197\*.

Sambalpur: ♀ 199\*, 200\*.

Sagar: ♀ 197\*, 202\*.

Jhansi: ♂ 192.

Ambalah: ♀ 201\*.

*Variation*: ♂ 177—196; ♀ 196—212 mm.

*Verbreitung*: Ceylon und Vorderindien, nach Norden zu begrenzt durch das Gangestal und die Grosse Indische Wüste.

Es bedeutet im vorstehenden:

P = nach Parrot, *Beiträge zur Ornithologie Sumatras* p. 187.

M = nach Müller, *J. f. O.* 1882 p. 411.



## DIE VÖGEL VON BALI.

AUS DEN ZOOLOGISCHEN ERGEBNISSEN DER II. FREIBURGER  
MOLUKKEN-EXPEDITION.

VON ERWIN STRESEMANN.

Ein unvorhergesehener Aufenthalt auf Bali, der sich auf die Zeit vom 11. Januar bis 16. April 1911 erstreckte, wurde unter anderem zur Anlage einer ornithologischen Sammlung auf der Insel benutzt und im ganzen während dieses Zeitraumes etwa 350 Bälge in 127 Arten zusammengebracht; von letzteren waren 53 neu für Bali, eine erwies sich als völlig neu für die Wissenschaft und gab zur Aufstellung eines neuen Genus Veranlassung (*Leucopsar* Stres., *Bull. B. O. Club*, vol. 31 p. 4). Die Kollektion befindet sich jetzt im Tring-Museum.

Die ersten Stichproben der Vogelwelt Balis verdanken wir Wallace, der sich auf seinen denkwürdigen Reisen im Archipel zwei Tage (am 13. und 14. Juni 1856) bei Buleleng aufhielt und 9 Arten erlangte; die Exemplare sind im Catalog der Vogelsammlung des British Museum angeführt und im folgenden als *Cat. B.* vol. . . p. . . citiert. Doch erst 40 Jahre später erhielten wir genauere Kenntnis über die balinesische Ornithologie, nachdem William Doherty im März und April 1896 eine grössere Sammlung an der Nordküste (offenbar hauptsächlich bei Buleleng, Gitgit und am Nordabfall des Gunung Bratan) veranstaltet hatte und dieselbe durch Dr. Hartert bearbeitet worden war, der die Ergebnisse in *Nov. Zool.* vol. iii. (1896) pp. 542–54 publicierte (im folgenden citiert als Hartert, p. . . ). Die Zahl der von Bali bekannten Arten erhöhte sich damit auf 96; sie ist nunmehr durch Hinzufügung von 53 weiteren Species auf 149 gestiegen (gegen etwa 109 auf der gleichgrossen Nachbarinsel Lombok bisher gesammelter Arten).

Unsere Hauptsammelpplätze waren :

1. Die Umgegend von *Buleleng*, des bedeutendsten Ortes an der Nordküste: weites, offenes, fast ganz flaches Kulturland, zum grössten Teil mit Sawahs (nassen Reiskulturen), Fruchtgärten und Kokospflanzungen bedeckt.

2. *Tjelukan Bawang*, die westlichste Ansiedlung an der Nordküste, eine kleine Mandaresenkolonie am Rande des grossen pfadlosen Urwaldes, der fast ganz Westbali (etwa  $\frac{1}{4}$  der Insel) vom Strand bis zum höchsten Gebirgskamm bedeckt: in geringer Entfernung vom Strand weite künstliche Lichtungen, dicht mit Dornestrüpp oder mit hohen Sumpfräusern bedeckt und von zahlreichen Wassergräben durchzogen; weiter landeinwärts lichter, parkähnlicher Urwald mit wenig Unterholz.—Längs des Meeresufers flacher mit Korallensand bedeckter Strand, vor der Küste einige ausgedehnte, bei Ebbe trockenliegende Korallriffe; mehrere bedeutende Bäche mit breiten versumpften Mündungen ergiessen sich in der Nähe des Ortes ins Meer.

3. *Gitgit*, 1500–2000 f. hoch südlich von Buleleng am Nordhang des Centralgebirges gelegenes Dorf: bis hier steigt das Kulturland empor, unmittelbar über der Ortschaft dagegen beginnt der Gebirgswald: mächtige Bäume, mit epiphytischen Farnen und Moosen überwuchert und von zahllosen Lianen umspannen, stellenweise dichtes Unterholz; sehr feucht, zur Regenzeit fast täglich

bedeutende Niederschläge. Längs des Trägerpfades, der von Gitgit aus mit Benutzung eines 4000 f. hohen Passes das Centralgebirge westlich vom Gunung Bratan überklettert, ausgedehnte Kaffeepflanzungen.

4. *Gunung Bratan*, nächst dem wenig höheren "Pik von Tabanan" mit etwa 2150 m. (6500 f.) der höchste Gipfel des Centralgebirges; zweimal (am 26. und 28. Januar) vom erwähnten Pass aus bestiegen: die Vegetation sehr dicht, die Bäume nehmen erst bei etwa 5000 f. merklich an Höhe ab; in der Nähe des Gipfels vorwiegend grosse dichte Büsche (*Rhododendron*) und hohe Farne, am Nordhang des Gipfels Kasuarinenwaldung.

5. *Danau Bratan*, grosser abflussloser Kratersee, südlich des Gunung Bratan und etwa im Centrum der Insel in 2500 f. Höhe gelegen, ganz von gewaltigem Urwald umgeben, die Ufer versumpft und mit hohen schilfartigen Gräsern bestanden.

6. *Kintamani*, eine der höchsten bewohnten Ortschaften der Insel, 1300 m. (4000 f.) hoch am Rande eines alten eingebrochenen Kraters inmitten der jungen Vulkanlandschaft angelegt, die den östlichen Teil der Insel charakterisiert: Weite, ganz baumlose Hügel, mit oft über mannshohen, meist aber niederen Gräsern und vereinzelt Büschen bestanden; Waldungen finden sich nur in den tief eingeschnittenen Wasserrissen und an steilen Abbrüchen (Charakterbaum: *Casuarina montana*). Jenseits des Kraterabbruches steigt der Aschekegel des tätigen Vulkans Gunung Batur auf, weiter südöstlich derjenige des gleichfalls, aber in weit geringerem Grade, tätigen Gunung Agung, der mit angeblich 3200 m. die höchste Erhebung der Insel darstellt.

Kintamani wurde von uns zweimal von Buleleng aus besucht; im März wurde sodann eine Reise, wiederum über das Ostgebirge, nach Südbali (Rendang, Klungkung, Gjanjar, Den Pasar, Marga) unternommen und von dort über den Danau Bratan der Rückmarsch nach Buleleng ausgeführt. Der grösste Teil des süd-balinesischen Hügellandes und der vorgelagerten weiten Ebene ist waldloses Gras- oder Kulturland.

Bevor ich zur Besprechung der einzelnen Arten übergehe, ist es mir eine angenehme Pflicht, Herrn Dr. von Rothschild meinen Dank auszusprechen für die grosse Liberalität, mit der er mir die Ausarbeitung meiner Sammlungen im Tring-Museum gestattete, die nur an der Hand eines so bedeutenden Vergleichsmaterials, wie es sich zur Zeit allein in Tring findet, bis in die feineren Details stattfinden konnte. Zu grossem Dank bin ich ferner Herrn Dr. Hartert für die freundliche Unterstützung und die mannigfachen wertvollen Ratschläge verpflichtet, die er mir bei der vorliegenden Arbeit hat zuteil werden lassen, sowie den folgenden Herren für gütige Übersendung von Vergleichsmaterial (dessen Benutzung in einer Anzahl kleinerer Nebenarbeiten verwertet wurde, welche unter dem Sammeltitle "Ornithologische Miscellen aus dem indo-australischen Archipel" in *Nov. Zool.* vols. xix und xx teilweise bereits ihre Veröffentlichung fanden): C. E. Hellmayr, Prof. Dr. Jacobi, G. M. Mathews, Dr. H. Meerwarth und Prof. Dr. Schauinsland.

Es war meine Absicht, ein vollständige Liste der bisher von Bali bekannten Vögel zu geben. Infolgedessen sind auch die ausschliesslich durch Doherty oder Wallace gesammelten Arten mit Nummer aufgeführt; sie sind jedoch durch Einschluss in Parenthese als nicht von mir erbeutet kenntlich gemacht. Nur beobachtete—nicht in Belegexemplaren gesammelte—Arten sind gleichfalls in

eckige Klammern gesetzt, wurden aber nicht numeriert. Mit einem \* bezeichnete Arten sind neu für Bali.

Was die Kennzeichnung der gemessenen Exemplare anbetrifft, so habe ich hierbei die von mir in den "Ornith. Misz." befolgte Methode beibehalten: Masszahlen ohne Zusatz beziehen sich auf Exemplare des Tring-Museums, solche mit einem \* auf ein Stück des British Museum.

In der systematischen Anordnung der Familien bin ich bis auf einige geringe Abweichungen Sharpe's *Handlist of Birds* gefolgt.

[**Excalfactoria chinensis** (L.).]

Mehrere kleine Wachteln, die zweifellos dieser Art angehörten, jagte ich Mitte Januar aus dem Strandgras in der Nähe von Buleleng auf.

1. **Gallus varius** (Shaw & Nodd.).

Hartert, p. 554.

♀, Kintamani, 4000 f., 1. iii.; ♂ juv., Tegal, 1500 f., 4. iii.; ♂ Kuta Dalem, 4500 f., 2. iii.; ♂ Kuta Dalem, 4500 f., 10. iii.; ♂ Tjelukan Bawang, 31. iii.

♂. Iris braungelb, Lauf grauweiss, Zehen graubraun, Oberschnabel braunschwarz, Unterschnabel braungelb. Kamm ganzrandig, rotviolett; nackte Haut der Kopfseiten und vordere Hälfte des Kehllappens schwärzlich rot, hintere Hälfte dunkelgelb; Mitte der Kammbasis und vorderer Winkel des Kehllappens blaugrün.

♀. Iris hellbraun, Füsse hell bräunlich grau, Oberschnabel schwarzbraun, Unterschnabel hell gelbgrau.

Häufig in der Allang-allang-Region des Gebirgskammes im Osten der Insel, besonders in der Nähe der Ortschaften, ebenso in der buschreichen Grasebene bei Tjelukan Bawang, wo diese Hühner vor Sonnenaufgang in den Pflanzungen dicht bei den Hütten der Eingeborenen äsen; vereinzelter traf ich sie in den Kaffeepflanzungen. Der Flug ist ziemlich rasch und gewandt, führt aber selten über grössere Strecken. (Im Hafen von Colombo entwich uns auf der Heimreise ein Hahn und flog auf einen wohl 1000 m. entfernten Dampfer.) Zuweilen baumen sie auf hohen Waldbäumen auf, meist aber bleiben sie am Boden, wo sie sehr rasch zu laufen verstehen. Bei Tage lebt *Gallus varius* im Büsch versteckt, paarweis, auch wohl zwei oder drei Männchen beisammen. Der häufig ausgestossene Ruf des Hahnes, ein raubes und in kurzen Pausen wiederholtes Ke-rek (dem Balzruf des Rephahnes ähnlich) hat dem Vogel den Namen Keker eingetragen; die Balier finden diesen Schrei wohltonend und halten das Wildhuhn daher oft gekäfigt, es legt jedoch niemals seine Scheuheit ganz ab. Bastarde zwischen *Gallus varius* und Haushühnern sah ich zuweilen bei grossen Hahnenkampfspielen verwendet.

*Verbreitung*: Java, Kangean, Bali, Lombok, Sumbawa, Flores, Sumba.

[2. **Turnix javanica javanica** Rafin.]

*Turnix taigoor pugnax*, Hartert, p. 554.

Ich sah die Art auf Bali nur in Gefangenschaft, doch soll sie in den Feldern nicht selten sein.

*Turnix javanica* Rafinesque 1814 = *Hemipodius pugnax* Temminck 1815; cf. Richmond, *Auk* 1909 p. 250.

3. *Treron griseicauda griseicauda* Gray:

*Treron (Osmotreron) griseicauda*, Hartert, p. 552.

♂ juv., Rendaug, 13. iii. ; ♂, Tjelukan Bawang, 26. iii. ; ♀, Tjelukan Bawang, 28. iii.

Iris gelbbraun oder orange ; Füße dunkel blaurot ; Schnabel-Basis dunkel grünblau, Apicalhälfte matt graugrün, äusserste Spitze braungelb ; nackte Augen- gegend grün.

Bei Tjelukan Bawang häufig auf mächtigen Fruchtbäumen im Urwald. Balinesisch : Kundu.

*Verbreitung* : Java, Bali, Lombok.—In der Celebes-region vertreten durch *P. g. wallacei*, *pallidior* und *sangirensis*.

[4. *Ptilinopus melanocephalus melanocephalus* (Forst.).]

*Ptilinopus melanocephalus*, Hartert, p. 553.

*Verbreitung* : Java, Kangean, Bali, Lombok, Sumbawa, Flores, Lomblen, Pantar, Alor, Sumba, Djampea, Kalao, Saleyer.

5. *Ptilinopus cinctus albocinctus* Wall.

*Ptilinopus albocinctus baliensis*, Hartert, p. 553.

3 ♂♂, Danau Bratan, 3000 f., 16. i. ; ♂, Danau Bratan, 17. i.

Iris braunrot, Füße dunkelrosa, Schnabelbasis grün, Schnabelspitze dunkelorange.—Ich vermag auf Grund der nun aus sieben Exemplaren bestehenden Baliserie keine constanten Unterschiede gegenüber Floresstücken zu entdecken. Die Flügel meiner Exemplare messen : 152, 154, 160, 163 mm.

Häufig auf fruchttragenden Ficusbäumen im Urwald des Danau-Bratan-Kessels, wo diese Tauben sich oft in grosser Anzahl einstellten. Sonst nicht beobachtet.

*Verbreitung* : Flores, Sumbawa, Lombok, Bali.

\* 6. *Ptilinopus porphyreus* (Temm.) (= *roseicollis* auct.).

♀, Danau Bratan, 3000 f., 16. i. ; ♂♀, Danau Bratan, 17. i.

Iris braunrot, Füße lebhaft fleischfarben, Schnabel mattgrün oder graugrün.

Nur in der Mulde des Danau Bratan beobachtet, auf Ficusbäumen unter der vorigen Art, aber viel weniger zahlreich als diese.

*Verbreitung* : Sumatra, Java, Bali.

7. *Carpophaga lacernulata williami* Hart.

*Carpophaga williami*, Hartert, p. 552.

♂, Gunung Bratan, 5000 f., 20. i. ; ♀, Tegal, 1500 f., 4. ii. ; 1 Ex., Tegal, 2000 f., 4. iii.

Füße dunkelrosa, Schnabel schwarzgrau oder blaugrau mit schwarzer Spitze. Flügel 198, 202, 203 mm.—Vollkommen mit dem Typus übereinstimmend.

Nicht selten in der Region der Kaffeepflanzungen, zumal in Ostbali. Im primären Urwald traf ich diese Taube nur vereinzelt an.

*Verbreitung* : Bali.

8. *Macropygia ruficeps ruficeps* Temm.

*Macropygia ruficeps*, Hartert, p. 554.  
*Nor. Zool.* vol. xx. p. 311.

♀, Tegal, 1500 f., 9. iv.

Füsse dunkel rot, Oberschnabel schwarzbraun, Unterschnabel heller.

*Verbreitung* : Java, Bali, Lombok ?

9. *Macropygia phasianella emiliana* Bp.

*Macropygia emiliana*, Hartert, p. 554.

♂, Tjelukanbawang, 30. iii.

Nur sehr vereinzelt angetroffen ; Aufenthalt meist in dichtem Gebüsch. Balinesisch : Kutu lang.

*Verbreitung* : Borneo, Barussan-Inseln?, Java, Kangean, Bali, Lombok, Flores.  
 Flügellänge in mm. :

Borneo: 165, 169, 178 [5 Ex. nach Finsch, *N. L. M.* vol. xxvi p. 139 : 158—173].

Java : 163 [23 Ex. nach Finsch : 165—178].

Kangean : 182 [2 Ex. nach Finch : 195—210].

Bali : 167, 167, 172.

Lombok : 168, 169, 180, 182, 184.

Flores : 167, 170.

Nias (*M. ph. modiglianii*) : 188.

Si-Oban : 176, 180.

10. *Streptopelia chinensis tigrina* (Temm.).

*Turtur tigrinus*, Hartert, p. 554.

♂, Buleleng, 12. i ; ♀, Danau Bratan, 2500 f., 19. i ; 2 ♀ ♀, Buleleng, 11. iv.

Füsse weinrot oder dunkel bläulich rot, Schnabel schwarz. Flügel 141, 142, 144, 144 mm.

Sehr häufig in der Kulturzone, seltener im lichten Urwald, bei Kintamani bis 4000 f. aufsteigend. Nest im Wipfel hoher Kokospalmen. Ein solches enthielt am 26. März zwei Eier ; 1 Ei misst : 27.2 × 21.6 mm. Balinesisch : Kukur.— Auf Bali ebenso wie auf Java ein sehr beliebter Käfigvogel, zu dessen gegenwärtiger weiter Verbreitung sicherlich zum grössten Teil der Mensch beitrug. Ich selbst schoss ein entwachsenes Exemplar in den Gärten von Ambou, wo die Art zufolge glaubwürdiger Aussagen der Eingeborenen nicht heimisch ist, und wenn sie von Salvadori in *Orn. Pap.* vol. iii p. 152 von hier sowie von Batjan, Halmahera, Ternate und Tidore angeführt wird, so handelt es sich ganz offenbar in allen Fällen ihres Nachweises auf diesen Inseln um der Gefangenschaft entflozene Exemplare. In Celebes wurde die Art nach A. B. Meyer (*Ibis* 1879 p. 137) um das Jahr 1835 eingeführt, ebenso soll sie nach Borneo durch den Menschen von Java her gebracht worden sein (fide Everett, cf. Meyer & Wigglesworth, *Birds of Celebes* p. 645).—Dieser ganz recenten Verbreitung ist es wahrscheinlich zuzuschreiben, dass die Form noch nicht in—mit unseren Unterscheidungs-methoden wahrnehmbare—Localrassen zerfallen ist. Freilich wurde eine solche von Parrot als *Turtur tigrinus minor* beschrieben. Ich stehe indessen dieser Form, als deren typische Localität Deli auf Sumatra angegeben ist, nach Messung von über 70 Exemplaren des Tring-Museums aus allen Teilen des Verbreitungsgebietes

von *S. ch. tigrina* skeptisch gegenüber. Tatsache scheint zu sein, dass der Durchschnitt des Flügelmasses bei Vögeln von den kleinen Sundainseln etwas höher liegt als bei solchen von Java, Sumatra und Malakka, indem unter den von mir gemessenen Exemplaren aus der Inselkette von Bali bis Babbar das Minimum nicht unter 140 mm. sinkt, während ich bei Sumatra und Malakkavögeln ein kleinstes Mass von 137, bei solchen von Pegu und von Java ein solches von 138 mm. fand. Indessen ist die Grössenvariation bei dieser Art an gleicher Localität sehr beträchtlich; sie schwankt bei den mir vorliegenden Javanern zwischen 138 und 149, bei Vögeln von Burma zwischen 139 und 150, von Flores zwischen 140 und 150, von Sumbawa gar zwischen 143 und 159 mm. Ein Exemplar von Deli-Sumatra misst 142 mm., während Parrots Maximalmass von Sumatra 138.5 mm. betrug. Sehr auffällig ist mir lediglich die sehr geringe Flügellänge der zwei mir vorliegenden Palawan-Stücke: 134 und 135 mm.; nach McGregor, *Man. Philipp. Birds*, p. 57, freilich ist die Art dort nur Wintergast (? !).

\*11. *Streptopelia bitorquata bitorquata* (Temm.).

♂, Kintamani, 4000 f., 22. ii.

Iris gelborange, Füsse dunkelrosa, Schnabel schwarz.

Ich constatirte nur dieses Exemplar, das sich unter einem kleinen Flug der vorigen Art befand.

*Verbreitung*: Java, Bali, Lombok, Sumbawa, Flores, Solor, Timor.—Auf den Philippinen, den Sulu-Inseln, Palawan und in Nord-Borneo durch *Streptopelia bitorquata dussumieri* vertreten.

12. *Geopelia striata striata* (L.).

*Geopelia striata*, Hartert, p. 554.

♂, Buleleng, 12. i.; ♀, Buleleng, 7. iv.

Iris weiss, Füsse dunkelgrau, Schnabel dunkel blaugrau, nackte Augengegend grünlich gelb.

Gemein in der Kulturzone; ich traf diese Art auch im lichten Kasuarinenwald am Gunung Batur in 3500 f. Höhe. Nester in Gebüsch, über mannshoch, sehr flüchtig gebaut. Gelegezahl 2. Zwei belegte Nester fand ich am 26. und 28. März in der Nähe des Strandes bei Tjelukan Bawang; 3 Eier messen: 22.3 × 17.7; 22.3 × 17.7; 23.2 × 17.5 mm. Balinesisch: titiran.

Auch diese Art wird bekanntlich sehr viel im Käfig gehalten und verdankt sehr wahrscheinlich ihre weite Verbreitung zum Teil diesem Umstand. Dass sie auf Ambon, von wo sie Salvadori im *Cat. B.* vol. xxi p. 460 aufführt nicht heimisch ist, glaube ich mit Bestimmtheit versichern zu können; auf dem nahen Ceram wurde sie von mir und den früheren Reisenden nicht ein einziges Mal getroffen. Auf Babber (cf. Meyer & Wiglesworth, *Birds (el.* p. 648) wurde sie offenbar gleichfalls eingeführt, da sie auf allen Inseln zwischen Lombok und Babber fehlt und hier durch *G. striata maugeus* ersetzt wird.

[13. *Chalcophaps indica* (L.)]

Hartert, p. 554.

Ich beobachtete diese Taube nicht selten in den Fruchtgärten der Eingeborenen bis zu 2000 f. Da sie sich mit Vorliebe am Grunde unter dichtem Gebüsch aufhält, so ist sie schwierig zu erlegen. Als Nahrung dienen ihr hauptsächlich die Früchte von Zingiberaceen und Alpinaceen.

Hartert, p. 554.

[14. *Rallina fasciata* (Raffl.).]

\*15. *Amaurornis phoenicura javanica* (Horsf.).

Nov. Zool. vol. xx p. 303.

♂, Tamblang, 750 f., 9. iii.; ♀, Tjelukan Bawang, 26. iii.; ♀, Tjelukan Bawang, 29. iii.; ♂, Buleleng, 3. iv.

Iris rotbraun, Füße gelb (ad.) oder dunkel braunoliv (juv.), Schnabel dunkel grünoliv oder grün, Stirnplatte rot.

Auf Bali häufig in nassen Reisfeldern und auf sumpfigen Grasflächen. Bereits durch Doherty gesammelt, aber in der Hartertschen Liste nicht aufgeführt. Balinesisch: Ker-koäk.

Verbreitung: Natuna, Borneo, Palawan, Sulu-Inseln, Philippinen, Sangir, Talaut, Sumatra, Barussau-Inseln, Bangka, Java, Kangean, Bali.

[*Gallinula chloropus orientalis* Horsf.]

Mehrfach im Rohrgürtel an den Seen Danau Bujan und Danau Bratan beobachtet.

[*Sterna bergii cristata* Steph. ?]

Ende März zwei Exemplare bei Tjelukan Bawang gesehen.

\*16. *Arenaria interpres* (L.).

♀, Tjelukan Bawang, 28. iii.

Nur dieses Exemplar am Strand beobachtet.

\*17. *Charadrius dominicus fulvus* Gm.

2 ♂♂, Bubunan, 31. iii.

Nur an diesem Tage, offenbar einem Tage starken Zuges, mehrere unter rastenden Bekassinenscharen auf brachliegenden Feldern beobachtet. Die erlegten Stücke tragen noch nicht das volle Brutkleid.

\*18. *Charadrius geoffroyi* (Wagl.).

♂, Tjelukan Bawang, 30. iii.

Ende März am Strand und auf Korallenriffen beobachtet, in Flügen bis zu 6 Stück vereinigt.

[*Numenius phaeopus variegatus* (Scop.).]

Ich beobachtete am 27. März ein Exemplar am Strand bei Tjelukan Bawang.

\*19. *Tringa glareola* L.

2 ♂♂, Buleleng, 10. ii. und 3. iv.

Iris dunkelbraun, Füße gelbgrün oder braungelb; Schnabel schwarz, an der Basis grünlich grau.

Gemein in den Reisfeldern, truppweis lebend.

20. *Tringa hypoleucos* L.

*Tringoides hypoleucos*, Hartert, p. 554.

♀, Buleleng, 12. ii.

Von Januar bis April sehr häufig am Strand, zuweilen auch an kleinen, dicht bei der Küste gelegenen Süßwassertümpeln.

\*21. *Gallinago stenura* (Bp.).

2 ♀ ♀, Bubunan, 31. iii.

Iris dunkelbraun, Füße rötlich braun oder grauschwarz, Basalhälfte des Schnabels braungelb, Apicalhälfte schwarz.

Nicht selten von Januar bis Mitte April in den Reisfeldern, am 31. März grosse Scharen auf den brachliegenden Feldern bei Bubunan. Einige Exemplare beobachtete ich auch in der Allang-allang-Region am Danau Bratan, 2500 f. hoch. Balinesisch: tiling.

[*Esacus magnirostris* (Vieill.)]

Am 27. März ein Exemplar auf einem Koralleuriff beobachtet.

[*Dissoura episcopus neglecta* Finsch.]

Ein Exemplar dieser Art sah ich bei Rendang (Süd-Bali).

Verbreitung: Java, Bali, Lombok, Sumbawa; Celebes (?), Philippinen (?).

[*Leptoptilus javanicus* (Horsf.)]

Ein Deutscher, der zur Tigerjagd nach Bali gekommen war, erzählte mir, dass er in Westbali einen Marabu gesehen habe.

\*22. *Ardea sumatrana* Raffl.

♀ immat., Tjelukan Bawang, 29. iii.

Mit Sicherheit nur dieses Exemplar beobachtet, das ich unter anderen Reiheren an einer Flussmündung überraschte.

\*23. *Ardea purpurea manillensis* Meyer.

♀, Buleleng, 5. iv.

Iris hellgelb, nackter Teil des Unterschenkels gelb, Lauf und Zehen schwarz, Lauf- und Fusssohle gelb. Oberschnabel schwarz, Augengegend und ein auf dem Oberschnabel nach vorn ziehender Streif gelb; Unterschnabel bräunlich gelb.

Vereinzelt in den Sawahs. Am 24. März ein Nest mit halbflüggen Jungen in der Krone eines mächtigen Waringinbaumes im Dorfe Radjatama. Balinesisch: gnors-gnorsan.

\*24. *Egretta intermedia intermedia* (Wagl.)

♂ immat., Bubunan, 31. iii.

Iris gelb, Füße schwarz, Schnabel gelb, Spitze des Oberschnabels schwarz, nackte Augengegend hell citrongelb.

Scharenweis in den Sawahs bei Bubunan und Gjanjar.



**\*25. Egretta garzetta nigripes (Temm.).**

2 ♂♂, Buleleng, 26. iii.

Iris grau, Füsse schwarz, Schnabel schwarz, Basis des Oberschnabels und nackte Augengegend gelb.

Häufig in den Sawahs. Ende März nisteten mehrere Paare in der unten erwähnten Brutkolonie unter *Ardeola speciosa*.

[**Demiegretta sacra (Gm.).**]

Mehrere Paare am Strand der Nordküste beobachtet.

**\*26. Ardeola speciosa (Horsf.).**

♀, Buleleng, 12. i.; ♀, Djelautek, 2000 f., 20. iii.; ♀, Buleleng, 26. iii.; ♀, Bubunan, 31. iii.; ♀, Buleleng, 2. iv.; ♀, Buleleng, 9. iv.

Iris goldgelb, Füsse braunrot oder gelblich grün, Schnabel an der Wurzel blaugrau, in der Mitte dunkelgelb, an der Spitze schwarz. Nackte Augengegend grün.

Bei weitem der häufigste Reiher auf Bali, der in sehr grosser Anzahl in den Sawahs lebt. Eine starke Brutkolonie befand sich in einigen grossen Bäumen vor dem Hause des Residenten in Singaradja, inmitten der Ortschaft. Ende März enthielten zahlreiche Nester Junge, nach dem Betragen der Alten zu schliessen, die mit Nahrung im Schnabel aus und ein flogen.

*Verbreitung*: Borneo, Sumatra, Java, Bali, Lombok, Sumbawa, Sumba, Saleyer, Buton, Celebes.

**\*27. Ardeola ibis coromanda (Bodd.).**

♂, ♀ immat., Buleleng, 26. iii.

Iris gelb, Füsse schwarz, Schnabel hell bräunlich gelb, nackte Augengegend gelb.

Nicht selten in den Sawahs; unter grossen Scharen von *Ardeola speciosa* nächtigten regelmässig einige auf den Schlafbäumen vor dem Hause den Residenten in Singaradja; vielleicht befanden sich dort auch ihre Nester.

**\*28. Ixobrychus sinensis (Gm.).**

♂, Buleleng, 2. iv.

Iris gelb, Füsse gelblich grün, Oberschnabel braunschwarz mit gelber Schneide, Unterschnabel braungelb.

Nur dieses Stück constatiert.

**\*29. Butorides striata javanica (Horsf.).**

♂, Tjelukan Bawang, 28. iii.; ♀, Buleleng, 8. iv.

Iris gelb; Lauf und Zehen grünlich, Sohlen dunkelgelb; Oberschnabel schwarz, Unterschnabel und Augengegend gelblich grün.

Sehr vereinzelt beobachtet: Am Strand und in den Sawahs. Balinesisch: Kokokan maling.

[**Dendrocygna arcuata (Cuv.)?**]

Eine grosse braune Entenart, wahrscheinlich zu dieser Art gehörig, ist häufig auf den Binnenseen Danau Bujan und Danau Bratan.

[*Fregata aquila* (L.) ?.]

Fregattvögel sah ich mehrfach an der Küste.

[*Ictinaëtus malayensis* (Temm.).]

Von Doherty auf Bali erlegt, aber nicht conserviert; cf. *Nor. Zool.* vol. iii p. 543.

\*30. *Spilornis bassus* (Forst.).

♂, Tjelukan Bawang, 30. iii.

Iris und Füße gelb, Schnabel braunschwarz, Wachshaut und Angengegend gelb. Flügel 384 mm.

Nicht selten, zumal im Flachland, wo die Vögel von abgestorbenen Bäumen herab Ausschau zu halten pflegen.

*Verbreitung*: Bali, Java, Sumatra, Malakka, Borneo, Philippinen(?); stellenweise anscheinend neben *Sp. pallida* auftretend.

*Falco bassus* Forster 1798 = *Falco bacha* Daudin 1800; cf. Richmond, *Proc. U. St. Nat. Mus.* vol. xxxv p. 592 Anm.

[*Haliaëtus leucogaster* (Gm.).]

Ich beobachtete Ende März ein Exemplar am Strande bei Tjelukan Bawang.

[*Haliastur indus indus* (Bodd.) > *girrenera* (Vieill.).]

Vereinzelte von mir am Strand beobachtet; im Februar ein Paar über dem fischreichen Kratersee Danau Batur, ± 3000 f. hoch.

\*31. *Microhierax fringillarius* (Drap.).

♂, Pik von Buleleng, 3000 f., 15. i.; ♀, Tjelukan Bawang, 28. iii.

Iris dunkelbraun, Schnabel und Füße schwarz. Flügel ♂ 92, ♀ 101 mm.

Ich beobachtete auf Bali nur drei Paare dieses zierlichen kleinen Falken, eines davon am Gunung Bratan in 5000 f. Höhe.

*Verbreitung*: Tenasserim (im Tring-Mus. 2 Ex. von Ataran), Malakka, Borneo, Sumatra, Java, Bali.

\*32. *Falco moluccensis occidentalis* (M. & W.).

♂, Kintamani, 4000 f., 24. ii.

Iris dunkelbraun, Füße hellgelb; Schnabel an der Basis hellgrau, nach der Spitze zu dunkler werdend; Wachshaut hellgelb.

Vereinzelte über den Allang-allang-Hängen des Gebirgskammes bei Kintamani beobachtet.

*Verbreitung*: Java und Inselkette von Bali und Kangean bis Tenimber; Kalao, Djampea, Binungko, Celebes.

Vereinigt man—was durchaus konsequent ist—das Genus *Ieracidea* mit *Falco*, so muss die obige Form neu benannt werden.

**\*33. *Ketupa ketupa* (Horsf.).**

♂, Djelantek, 2000 f., 20. iii.

Iris dunkelgelb, Füße hell braungelb, Schnabel grauschwarz.—Flügel 355 mm.

Nur ein Paar beobachtet, das in einem mächtigen Waringinbaum sass und von zwei Spilornis unter wütendem Geschrei umflogen wurde.

*Verbreitung*: Assam, Burma, Tenasserim, Malakka, Borneo, Sumatra, Java, Bali.

**[34. *Glaucidium castanopterum* (Horsf.).]**

Hartert, p. 552.

*Verbreitung*: Java, Bali.

**[35. *Phodilus badius* (Horsf.).]**

Hartert, p. 552.

*Verbreitung*: Ost-Himalaya, Assam, Burma, Tenasserim, Malakka, Sumatra, Nias, Borneo, Java, Bali.

**[*Eos* ? sp.]**

Bei Tegal (Ostbali, 2000 f.) beobachtete ich häufig eine vollständig rote Papageienart vom *Eos*-Habitus mit schwarzer Flügelzeichnung, die sich mit Vorliebe in den Schattenbäumen der ausgedehnten Kaffeepflanzungen aufhielt. Trotz langer Bemühungen gelang es mir leider nicht, einen dieser sehen und im Blättergewirr sehr schwer erkennbaren Vögel, die wahrscheinlich einer unbekannten Art angehören, zu erlegen.

**\*36. *Trichoglossus haematodus mitchelli* Gray.**

2 ♂♂, 2 ♀♀, Gunung Bratan, 4000 f., 30. i.

Iris hellorange, Füße hellgrau, Schnabel gelbrot.—Ganz mit einer grossen Serie aus Lombok übereinstimmend. Über letztere vergl. Hartert, *Nov. Zool.* vol. viii p. 68.

Die Art ist auf Bali, ebenso wie auf Lombok, auf die höhere Gebirgsregion beschränkt; sie war am Gunung Bratan an Urwaldlichtungen nicht selten und trat hier gewöhnlich in kleinen Flügen auf.—Ich sah auf der Insel niemals geküfigte Stücke dieses Papageis.

*Verbreitung*: Lombok, Bali.

**[*Cacatua parvula occidentalis* Hart.]**

Doherty berichtete in litt. über das Auftreten dieser Art auf dem Tafel-hoek in Südbali (vergl. *Nov. Zool.* vol. iii p. 543). Meine in Den Pasar eingezogenen Erkundigungen bestätigten diese Angabe nicht; es gibt zwar in Südbali einzelne freifliegende Kakadus, es sind dies indessen gezähmte, die von Lombok her eingeführt wurden und nicht zur Fortpflanzung schreiten. Dagegen soll der Kakadu ziemlich häufig auf der Insel Nusa Penida, südöstlich von Bali, nisten. Ob er dorthin ohne Zutun des Menschen gelangt ist, muss ich dahingestellt sein lassen. Die ungünstigen Schiffsverbindungen machten mir einen Besuch dieser Insel leider unmöglich.

37. *Conurus alexandri alexandri* (L.).

*Palaeornis alexandri*, Hartert, p. 552.

♂, Lumbanan, 600 f., 13. ii.; 2 ♂♂, Tegal, 1500 f., 2. iii.; ♀, Buleleng, 4. iv.

Iris weiss, Füsse gelbgrün, Schnabel gelblich rot mit gelber Spitze.

Ziemlich häufig in der Kulturregion, besonders in Kokosplantagen. Diese Art wird nicht selten von Eingeborenen in Gefangenschaft gehalten.

*Verbreitung*: Java, Bali, Kangean.

*Conurus fasciatus* gehört dem gleichen Formencomplex an.—Über *Conurus* Kuhl 1820 vs. *Palaeornis* Vigors 1825 vergl. Mathews, *Nov. Zool.* vol. xviii p. 11.

\*38. *Loriculus vernalis pusillus* Gray.

5 ♀♀, 1 ♂, Danau Bratan, 2500 f., 20. i.; ♂, Gunung Bratan, 4000 f., 28. i.

Iris graubraun, gelbbraun oder hellgrau, Füsse orange, Schnabel orangerot oder zinnober.

Im Gebirge überall häufig, oft in Schwärmen bis zu 30 Stück. Sehr charakteristisch für diese Vögel ist ihr zirpender Ruf. Sie bevorzugen zum Aufenthalt die Kronen hoher Urwaldbäume und sind dort, solange sie unbeweglich verharren—und dies währt oft lange Zeit—nicht von den Blättern zu unterscheiden.

*Verbreitung*: Java, Bali.

\*39. *Eurystomus orientalis orientalis* (L.).

*Nov. Zool.* vol. xx p. 298.

♀, Buleleng, 13. i.; ♂, Tegal, 1500 f., 9. iv.

Iris dunkelbraun, Füsse ziegelrot, Schnabel ziegelrot, Spitze des Oberschnabels schwarz.

Sehr vereinzelt beobachtet.

*Verbreitung*: Bali, Java, Sumatra, Billiton, Borneo, Labuan, Sibutu, Sulu-Archipel, Philippinen, Siao, Sangir, Talaut, Celebes mit Ausnahme der südlichen Halbinsel.

[40. *Alcedo ispida floresiana* Sharpe.]

*Alcedo ispida bengalensis*, Hartert, p. 550.

*Nov. Zool.* vol. xx p. 315.

*Verbreitung*: Bali, Sumbawa, Flores, Alor, Wetter, Timor, Sumba, Romah.

41. *Alcedo meninting meninting* Horsf.

Hartert, p. 550.

♂, Buleleng, 4. iv.

Iris schwarzbraun, Füsse und Krallen leuchtend blutrot, Oberschnabel schwarz, Unterschnabel schwärzlich rot. Flügel 66 mm.

Sehr vereinzelt an Flussmündungen beobachtet.

*Verbreitung*: Süd-Tenasserim, Malakka, Borneo, Balabac, Palawan, Calamianes, Sulu-Archipel, Celebes, Peling, Banggai; Bangka, Billiton, Sumatra, Batu-Inseln, Java, Bali, Lombok.

Die Abtrennung der Vögel von den Batu-Inseln (als *A. m. callima*, durch Oberholser in *Smiths. Misc. Coll.* vol. lx No. 7 p. 7) wegen bedeutenderer Grösse

und etwas grünlicherer Oberseite erscheint mir sehr gewagt, in Anbetracht der bei dieser Art nicht unbeträchtlichen individuellen Grössen- und Färbungsvariation. 2 Exemplare des Tring-Museums von Tana Balla, also aus nächster Nähe des typischen Fundortes von Oberholzers *callima*, variieren untereinander in der Färbung der Oberseite: das eine, bläulichere, stimmt mit 4, das andere, grünlichere, mit 3 Javastücken vollkommen überein; ein siebentes Javastück ist noch grünlicher als dieses. Auch besteht keine beachtenswerte Grössendifferenz.

Flügelänge in mm.:

Bali: 66, 66, 67, 70.

Java: 62·5, 63, 63, 63·5, 64, 65, 66, 66, 67.

Peling: 64.

Tawi-tawi: 67.

Maimbun (Sulu-Arch.): 64.

Bongao: 67.

Borneo: 62, 63·5, 64.

Palawan: 59, 65.

Bangka (nach Parrot): 58, 62, 62, 62, 62·2.

Malakka; 62, 62, 62·5, 63, 64.

Tana Massa: 64, 68.

Vergl. ferner die Massangaben bei Finsch, *Not. Leyd. Mus.* vol. xxvi p. 49, und Meyer & Wiglesworth, *The Birds of Celebes*, p. 267.

#### \*42. *Alcedo beryllina* Vieill.

♀, Buleleng, 11. ii.; ♀, Tjelukan Bawang, 27. iii.; ♀, Buleleng, 3. iv.; ♂, Buleleng, 7. iv.

Iris dunkelbraun, Füsse schwarz oder rötlich schwarz, Sohlen schmutzig rot, Schnabel schwarz.

Öfters in der Nähe der Mündungen kleiner Flüsse an der Nordküste beobachtet. Ruf ein durchdringender Pfäff ähnlich dem von *Alcedo isipida*. Balinesisch: sawanié.

*Verbreitung*: Java, Kangean, Bali, Lombok.

#### 43. *Halcyon chloris collaris* Scop.

*Halcyon chloris*, Hartert, p. 551.

♀, Buleleng, 12. ii.; ♂, Buleleng, 6. iv.

Iris dunkelbraun, Füsse schwarz oder dunkelbraun, Oberschnabel schwarz, Unterschnabel weisslich hornfarben mit schwarzer Spitze.

Mit Javaexemplaren gut übereinstimmend, nicht aber mit solchen aus den Molakken, die in der Regel unterseits ausgesprochener cremefarben getönt und auf Kopf und Rücken dunkler und grünlicher, weniger blau sind. Flügel: ♀ 112, ♂ 113 mm.

Gemein überall in der Kulturregion, bis etwa 3000 f. aufsteigend. Balinesisch: ptenkét.

#### 44. *Halcyon sancta* Vig. & Horsf.

*Halcyon sanctus*, Hartert, p. 551.

♀, Buleleng, 5. v.

Iris dunkelbraun, Füsse schmutzig hellgrau, Oberschnabel schwarz, Unterschnabel weisslich hornfarben mit schwarzer Spitze.

Häufig von Ende März ab in der Kulturregion, indessen weniger zahlreich als *Halcyon chloris*.

Gast während des australischen Winters.

45. *Halcyon cyanoventris* (Vieill.).

*Halcyon cyanoventris*, Hartert, p. 551.

♀, Gjanjar, 15. iii.

Schnabel und Füsse rot.

Ich sah mehrere Exemplare an Bachläufen im Kulturland Südbalis.

Verbreitung: Java, Bali.

\*46. *Ramphalcyon capensis floresiana* (Sharpe).

1 Ex.: Buleleng, 2. iv.

Iris schwarz, Lidrand rot; Füsse leuchtend rot; Schnabel rot, Oberschnabel dunkler als Unterschnabel.

Selten an Wasserläufen in der Küstenebene Nord-Balis.

Verbreitung: Flores, Sumbawa, Lombok, Bali.

Über *Ramphalcyon* vs. *Pelargopsis* vergl. Oberholser, *Proc. U. St. Nat. Mus.* vol. xxxv p. 657 ff.

[47. *Ceyx rufidorsa innominata* Salvad.]

*Ceyx innominata*, Hartert, p. 551.

Verbreitung: Java, Kangean, Bali, Lombok, Sumbawa, Flores, Sumba.

[48. *Anthracoceros coronatus convexus* (Temm.).]

*Anthracoceros convexus*, Hartert, p. 551.

Dieser Nashornvogel soll in den grossen Gebirgswäldern des Westens häufig sein. Ich sah ihn nur bei Gitgit, wo mehrmals Flüge bis zu 8 Stück in grosser Höhe über das Tal hin dem gegenüberliegenden bewaldeten Berghang zuflogen.

Verbreitung: Malakka, Natuna-Archipel, Borneo, Sumatra, Java, Bali.

49. *Melittophagus leschenaulti leschenaulti* (Vieill.).

*Melittophagus leschenaulti*, Hartert, p. 550.

♂ ♀, Tjelukanbawang, 27. iii.; ♂, Buleleng, 10. iv.

Iris rot, Schnabel und Füsse schwarz.

Häufig am Rande grosser Urwaldlichtungen an der Westküste Balis.

Verbreitung: Java, Bali.—Der gleichen Formengruppe gehört *M. l. swinhöi* an.

50. *Merops philippinus philippinus* L.

*Merops philippinus*, Hartert, p. 550.

♀, Buleleng, 11. ii.; ♀, Buleleng, 10. iv.

Iris dunkelkarmin, Füsse schwarzbraun, Schnabel schwarz.

Ich sah diese Vögel nicht selten über den Reisfeldern schweben, meist mehrere beisammen. Bis etwa 2000 f. aufsteigend.

Die Art brütet auf Bali und den benachbarten Inseln wahrscheinlich nicht, wurde aber doch von Everett auf Lombok im Juli, von Doherty auf Sumbawa im August gesammelt. Alle übrigen Exemplare des Tring-Museums von den kleinen Sunda-Inseln datieren aus den Monaten November bis April.—Die von mir festgestellten Maximalmasse der Flügellänge sind: Ceylon 138, Pini 135·5, Java 133 mm.

Im Bismarck-Archipel und in Deutsch-Neuguinea durch *Merops philippinus salradorii* vertreten.

### 51. *Hemiprocne longipennis longipennis* (Rafin.).

[*Hirundo longipennis* Rafinesque, *Bull. Sc. Soc. Phil. Paris*, No. 68 vol. iii p. 153 (1803—Java).]

[*Hirundo klecho* Horsfield, *Trans. Linn. Soc. Lond.* vol. xiii p. 143 (1822—Java) ]

*Macropteryx longipennis*, Hartert, p. 549.

♀, Pik v. Buleleng, 1500 f., 13. i.; ♂, Tjelukan Bawang, 30. iii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Ziemlich häufig am Urwaldsaum, bis etwa 2000 f. aufsteigend.

*Verbreitung*: Java, Bali.—Hiervon ist zu unterscheiden

### *Hemiprocne longipennis harterti* subsp. n.

bei der das Grau der Unterseite dunkler ist und tiefer hinabreicht, nur die hintere Hälfte des Unterkörpers weiss lassend, während bei der typischen Form die Mitte des Unterkörpers etwa von der Brust ab weiss ist. Unterrücken und Bürzel dunkler grau, die hellsten inneren Armschwingen und Scapularen hell aschgrau oder weisslich grau statt weiss wie bei *H. l. longipennis*.

*Verbreitung*: Burma, Tenasserim, Malakka, Bunguran, Borneo, Bangka, Sumatra.

*Typus*: ♀, Deli (N.O. Sumatra), Januar 1889, E. Hartert coll., im Tring-Museum.

Ich widme diese Form Herrn Dr. Ernst Hartert, meinem verehrten Lehrer in malayischer Ornithologie.

In der Flügellänge stimmen beide Unterarten mit einander überein:

Bali: ♂ 168, 174.	♀ 169.
Java: ♂ 160, 162, 163, 164, 167.	♀ 164, 165.
Sumatra:	♀ 161, 164, 169.
Bunguran: ♂ 167.	♀ 165.
Malakka:	♀ 155, 158.
Burma: ♂ 161.	♀ 171.

Über die Anwendung von *Hemiprocne* Nitzsch 1829 für *Macropteryx* Swainson 1832 vergleiche man Oberholser, *Proc. Biol. Soc. Wash.* vol. xix p. 68.

### \*52. *Collocalia linchi linchi* Horsf. & Moore.

*Nor. Zool.* vol. xix p. 347.

♀, Buleleng, 14. ii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Häufig überall, am Gunung Bratan bis zu 5000 f. Höhe beobachtet. In dem steinernen Araberhaus in Buleleng, das wir gemietet hatten, schritten die Vögel Mitte März zur Brut; die Nester wurden an die Zimmerdecke geklebt. Das Belegexemplar ward am Nest geschossen.

*Verbreitung*: Java, Kungean, Bali, Lombok.

53. *Caprimulgus affinis affinis* Horsf.

*Caprimulgus affinis*, Hartert, p. 549.

♂, Buleleng, 12. i.; ♂ ♀, Tjelukan Bawang, 27. iii.

Iris, Füsse und Schnabel dunkelbraun.

Nicht selten, vornehmlich in der Nähe des Straudes, wo die Vögel bei Tage im Gestrüpp dicht oberhalb der Flutgrenze verborgen liegen. Balinesisch: tjerlepó.

*Verbreitung*: Sumatra, Borneo, Billiton, Java, Bali, Lombok, Sumbawa, Flores, Alor, Sumba, Savu, Timor, Kisser; Celebes.—Auf den Philippinen durch *C. a. griseatus* und *mindanensis* vertreten.

[54. *Surniculus lugubris lugubris* (Horsf.)]

*Surniculus lugubris*, Hartert, p. 552.

*Verbreitung*: Java, Bali; Ceylon.

Ich vermag Ceylonvögel durchaus nicht von Javanern zu unterscheiden. Beide stimmen in Färbung, Flügellänge und relativer Länge des Schwanzes völlig überein. Dagegen weichen Exemplare von Sumatra, Borneo und Malakka, in Grösse und Farbton der typischen Form gleichend, von ihr dadurch ab, dass die Länge des centralen Steuerfederpaares, von ihrem Austritt aus der Haut an gemessen, in der Regel geringer ist als diejenige des Flügels, nicht beträchtlicher wie bei *S. l. lugubris*. Ich trenne sie daher unter dem Namen

*Surniculus lugubris brachyurus* subsp. n.

ab.—*Typus*: ♂, Bentong, Pahang, 21. Juni 1910, No. 1725. 10, im Tring-Museum.—Bei ausgefärbten Vögeln von Palawan scheint die Unterseite in der Regel etwas schwärzlicher, weniger grau zu sein als bei typischen *brachyurus*, zugleich von geringerem und ausgesprochener bläulichem, weniger grünlichblauem Glanz als bei *S. l. dicruroides*—eine Annäherung an die Färbung von *S. l. velutinus*. Diese Beobachtung muss indessen an weiterem Material geprüft werden, da die Tönung der Unterseite auch individuellen Schwankungen unterworfen ist.—Das einzige untersuchte Stück von Banguran ragt mit seiner bedeutenden Flügellänge weit über den Durchschnitt von *S. l. brachyurus* hinaus.

Flügellänge in mm.:

Bali: 128.

Java: 122, 122·5\*, 124, 125·5, 131.

Ceylon: 124\*, 124\*, 125\*, 126\*, 126·5, 127\*, 128, 129\*, 131\*.

Sumatra: 121\*, 121·5, 122\*, 127\*, 129, 131, 132.

Borneo: 118, 119, 119, 120, 122, 124, 126\*, 127\*.

Malakka: 117\*, 119, 119\*, 119\*, 120, 120\*, 120\*, 121\*, 122\*, 122\*, 123\*, 124, 128\*, 128\*, 134, 139\*. *Durchschnitt* von 16 Ex.: 123·5 mm.

Lingga: 125.

Banguran: 144.

Die relative Länge von Flügel (*a*) und Schwanz (*c*) sei an folgenden Beispielen illustriert:

Bali: *a* 128, *c* 136.

Java: *a* 120, *c* 121; *a* 124, *c* 130; *a* 125·5, *c* 135; *a* 131, *c* 134.

Ceylon: *a* 126·5, *c* 130; *a* 128, *c* 131.



Sumatra: *a* 121·5, *c* 105; *a* 129, *c* 121; *a* 132, *c* 128.

Borneo: *a* 119, *c* 110·5; *a* 119, *c* 111; *a* 120, *c* 113.

Malakka: *a* 119, *c* 110; *a* 120, *c* 106; *a* 124, *c* 111; *a* 134, *c* 117.

Lingga: *a* 125, *c* 113.

Bunguran: *a* 144, *c* 133·5.

Durch bedeutendere Durchschnittsgrösse sowie dunklere und stärker glänzende Unterseite ist von *brachyurus* unterschieden:

### *Surniculus lugubris dicruroides* Hodgs.

Flügelänge in mm.:

Nepal (terra typ.): 139\*, 139\*, 139\*, 140\*, 145\*.

Sikkim: 136\*, 137\*, 137\*, 137\*, 138\*, 138\*, 138·5\*, 139\*, 139·5\*, 140\*, 140\*, 140·5\*, 141, 142, 142\*, 142·5\*, 144, 144·5\*, 145\*, 145·5\*, 147\*, 147\*, 147·5\*.  
Durchschnitt von 23 Ex.: 141·3 mm.

Bhutan: 144\*.

Assam: 134\*, 134\*, 135\*, 136\*, 136\*, 136\*, 137\*, 138\*, 138\*, 138·5\*, 138·5\*, 139\*, 139\*, 139\*, 141\*, 142\*, 143\*, 144\*, 144\*, 146\*.

Cachar: 135\*, 138\*.

Tonghoo: 148\*.

Kyank Pyu: 145\*.

S. Shan-Staaten: 136\*.

Siam: 135\*, 138\*.

Hainan: 137·5.

Chang-show (Szetschwan): 138.

Die Vögel vom südlichen Burma, Tenasserim und Salanga werden am besten mit der Formel

### *Surniculus lugubris brachyurus* $\leq$ *dicruroides*

bezeichnet.

Flügelänge in mm.:

Arakan: 132.

Bankassun: 132\*, 133\*, 136·5\*.

Karen-nee: 132\*.

Mandalay: 132·5.

Lower Pegu: 120, 131·5\*, 135·5\*, 139\*, 140\*, 141.

Tenasserim (Salwin-Mdg. bis Kra): 129·5\*, 130\*, 132\*, 132·5\*, 133\*, 134\*, 134\*, 135·5\*, 136\*, 136\*, 137\*, 140\*, 141\*. Durchschnitt von 13 Ex.: 134·7 mm.

### \*55. *Cuculus intermedius insulindae* Hart.

*Cuculus intermedius insulindae*, Hartert, *Vög. pal. Fauna* p. 952 (1912—Borneo).

♂, Gunung Bratan, 4000 f., 27. i.

Iris braunrot, Füsse leuchtend gelb, Oberschnabel schwarz, Unterschnabel hellgelb mit schwarzer Spitze. Flügel 152 mm.

Dieser Kuckuck ist nicht selten im Urwald, wo ich ihn von der Tiefebene bis hinauf zu 5000 f. antraf. Sein Ruf, den ich oft hörte, ist dem von *C. canorus* ähnlich und gleichfalls zweisilbig, doch liegen beide Tonsilben auf gleicher Höhe.

*Verbreitung*: Sumatra, Borneo, Java, Bali, Lombok, Sumbawa, Flores, Pantar (von allen diesen Localitäten befinden sich Exemplare im Tring-Museum).

[56. *Cuculus optatus* Gould.]

*Cuculus intermedius*, Hartert, p. 552.

Wintergast. (Vergl. Hartert, *Vög. pal. Fauna* p. 949.)

57. *Cacomantis sepulcralis sepulcralis* (S. Müll.).

*Cacomantis threnodes* (non Cab. & Heine !), Hartert, p. 551.

*Nov. Zool.* vol. xix p. 334.

♂, Batur, 3000 f., 23. ii.

Iris hellbraun, Füße grauliv, Oberschnabel schwarz, Unterschnabel dunkelbraun.

Nur dieses Exemplar beobachtet.

Verbreitung: Sumatra, Simalur, Java, Bali, Lombok, Sumbawa, Sumba; Philippinen, Sulu-Archipel, Palawan, Borneo ?

[58. *Cacomantis merulinus merulinus* (Scop.).]

*Cacomantis merulinus*, Hartert, p. 551.

*Nov. Zool.* vol. xix p. 332.

Verbreitung: Sumatra, Java, Bali, Borneo, Palawan, Sulu-Archipel, Philippinen, Celebes.

\*59. *Chalcococcyx basalis* (Horsf.).

♀, Tjelukanbawang, 27. iii.

Iris dunkelbraun, Lauf dunkelgrau, Zehen schwarz, Oberschnabel schwarz, Unterschnabel dunkelbraun. Flügel 98 mm.

Ich constatirte nur dieses eine Exemplar, im Gestrüpp am Strande.

Die Grenzen des Verbreitungsgebietes sind noch nicht hinreichend bekannt.

\*60. *Centropus sinensis bubutus* Horsf.

*Nov. Zool.* vol. xx p. 322.

♀, Tangkid, 1500 f., 6. iii.

Nur dieses Exemplar mit Sicherheit constatirt; es hielt sich in einem dicht mit Arengpalmen und Citrusbäumen bepflanzten Fruchtgarten auf.

Verbreitung: Malakka, Natuna, Borneo, Balabac, Palawan, Cagayan-Sulu?, Sumatra, Java, Kangean, Bali.

Die Manserverhältnisse liegen bei dieser Art wie bei *Centropus bengalensis*. Auch hier tritt im Laufe der Gefiederentwicklung normalerweise ein zweites Jugendkleid auf, das mit weniger deutlichen hellen Querbinden versehen zu sein pflegt als das erste.

61. *Centropus bengalensis javanensis* (Dumont).

*Centropus javanicus*, Hartert, p. 552.

*Nov. Zool.* vol. xix p. 337.

♀, 27. iii.; ♂, 29. iii.; ♂, 30. iii.—alle von Tjelukan Bawang.

Iris braun; Lauf grauschwarz, Zehen dunkler; Schnabel schwarz.

Nicht selten im Grasland und im dichten Gestrüpp der Kulturzone, wo der Vogel tagsüber ein sehr verstecktes Leben führt; des Abends pflegt er, auf einem starken Halm sitzend, sich durch einen weithin hörbaren Lockruf, der wie tuk tuk tuk . . . klingt, bemerkbar zu machen. Balinesisch: sawan udjan.

*Verbreitung* : Malakka, Natuna, Borneo, Palawan, Philippinen, Sulu-Archipel, Bangka, Sumatra, Java, Bali.

Die einzelnen Kleider dieses Grasknuckucks sind sehr verschieden gedeutet worden. Während Oates (*Birds of British Burma* p. 128; *Str. Feath.* vol. x p. 196) das Bestehen eines dem ersten Jugendkleid sehr ähnlichen Winterkleides behauptet—eine Angabe, die von Shelley im *Cat. B.* vol. xix p. 353 übernommen worden ist—betrachtet Blanford (*Birds Brit. Ind.* vol. iii p. 243) das gleiche Kleid als das zweite Jugendgefieder, das aus dem ersten ohne Mauser hervorgehen soll, und bemerkt hierzu: "The second garb is called the winter or seasonal plumage by most authors, but I can find no evidence that it is ever assumed by birds that have once attained adult coloration; and there are several winter birds in the British Museum collection with the adult dress."—W. Blasius beschreibt in *Zeitschr. Ges. Ornith.* 1885, pp. 267–70, eine Reihe von Bülgern, die teilweise verschiedene Altersstadien repräsentieren, mit grosser Ausführlichkeit, geht jedoch von der irrigen Ansicht aus, "dass die Anfärbung des Gefieders sowohl durch Umfärbung das älteren Jugendgefieders als auch durch Mauser bewirkt wird. Mir scheint es wenigstens höchst wahrscheinlich zu sein, dass das Jugendgefieder am Schwanz und Rumpfe zunächst sich im Dunkle umfärbt, bis dann bei der nächsten Mauser die Federn von vornherein im definitiven Farbentone hervorzunehmen."

Eine Reihe von Mauserbülgern des Tring-Museums lässt die Aufeinanderfolge der Gefieder klar erkennen.

### I. Jugendkleid.

Federn von Oberkopf und Nacken hell rötlich braun mit ebenso gefärbtem Schaft, apicale Hälfte der Federäste in der Regel schwarz oder dunkelbraun; Federn des Mantels und die oberen Flügeldecken, ebenso die **Arm- und Handschwingen** hell rotbraun mit rotbraunem Schaft, **schwarz quergebändert**. Unterrücken, Bürzel und Oberschwanzdecken bräunlich, eng schwarz quergebändert. Steuerfedern schwarz, oberseits mit grünlichem Metallglanz, und mit zahlreichen (die centralen mit etwa 15—25) schmalen, hell bräunlichen Querbinden versehen. Unterseite schmutzig gelbweiss, die Kropffedern meist rotbraun verwaschen und mit schwarzen Spitzen, die Federu der Körperseiten, die Schenkelbefiederung und die Unterschwanzdecken dagegen mit schwarzbraunen Querbinden.

Material : 6 Exemplare, darunter ein noch nicht flugbares.

Dieses Kleid wird offenbar schon nach wenigen Monaten (bei Vögeln von Cachar in den späten Herbstmonaten), vollständig, d. h. mit Einschluss des Grossgefieders, in das

### II. Jugendkleid

vermausert. In diesem besitzen die Federn von Oberkopf, Nacken und Mantel weissliche oder strohgelbe (nicht mehr rotbraune oder hell braune) Schäfte, die Federäste sind an der Basis strohgelb, werden nach der Mitte zu schwärzlich und gegen die Spitze hin braun. Die kleinen oberen Flügeldeckfedern sind rotbraun mit strohgelbem Schaft, die **Hand- und äusseren Armschwingen einfarbig rotbraun** mit schwärzlicher Spitze (seltener mit schwach angedeuteter Querbänderung), die innersten Armschwingen einfarbig schwärzlichbraun. Steuerfedern grünmetallisch, ohne oder mit nur schwach angedeuteter schmaler bräunlicher Querbänderung, die dann meist auf das apicale Fünftel beschränkt ist, aber stets mit weisslichem Spitzensaum von variierender Breite. Unterrücken- und Oberschwanzdeckfedern schwarz mit zahlreichen bräunlichen Binden; von den letzteren erreichen die beiden

mittelsten in diesem Kleide eine bedeutende Länge. Unterseite wie im ersten Jugendgefieder.

Infolge des beträchtlichen Unterschiedes in der Zeichnung, den Schwingen und Steuerfedern des ersten Jugendkleides gegenüber denen des zweiten aufweisen, lässt sich der Zustand des Grossgefieders bei Stücken, die im ersten Federwechsel begriffen sind, ohne weiteres beurteilen. Der Verlauf desselben sei im folgenden an einigen Beispielen illustriert, und zwar unter Benutzung eines Schemas, dessen Gedanke der Arbeit Heinroths in *Sitzungsber. Ges. Nat. Freunde Berlin* 1898 p. 101 entlehnt ist. Es stellen darin die mit R und L bezeichneten Balken die

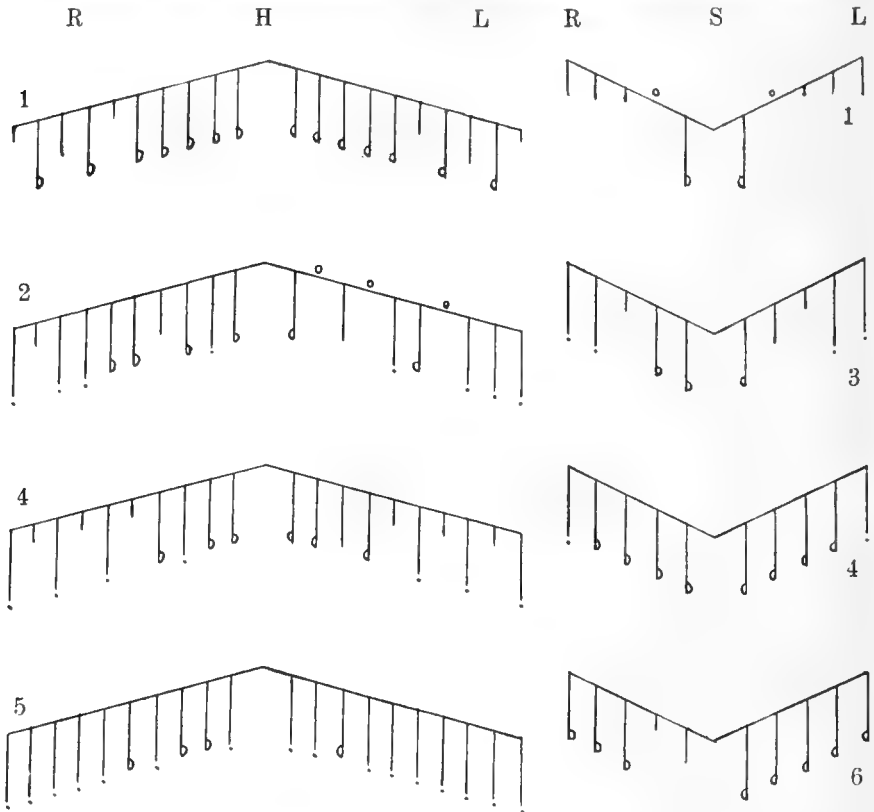


FIG. 1.

(1) Cachar, 10. x. 1895. (2) Timor, viii. 1897. (3) Leti, 3. xi. 1902. (4) Roma, 20. vii. 1902. (5) Leti, 21. xii. 1902. (6) Roma, 13. viii. 1902.

rechte und linke Hand des Vogels dar; der Arm ist weggelassen, da ein Zählen der Armschwingen am trockenen Balge grossen Schwierigkeiten begegnet. S bedeutet die Basis der Steuerfedern. Senkrechte Striche mit Köpfchen dienen zur Darstellung der alten noch unvermauserten Federn, Striche ohne Köpfchen, aber mit einem Punkt unter dem freien Ende bezeichnen eine ausgewachsene Jungfeder; "Schwingen, die noch nicht erwachsen, sind durch kürzere Striche im richtigen Verhältnis wiedergegeben. Dem Grössenverhältnis erwachsener Schwingen ist hierbei nicht Rechnung getragen." Die Ziffer 0 dient zur Bezeichnung einer Lücke, also der Stelle einer soeben ausgefallenen Feder,

Ich könnte diese Beispiele aus dem mir vorliegenden Material noch beträchtlich vermehren; sie alle zeigen die grosse Regellosigkeit im Verlauf der Mauser, die bald bilateral symmetrisch, bald asymmetrisch stattfindet. Für die Handschwinge-mauser ergibt sich eine gewisse Tendenz zu alternierendem, ascendentem Wechsel, die Mauser der Steuerfedern scheint nicht selten typisch centripetal sich abzuspitzen (vergl. fig. 1 und 4).

Ein ♂ von Nordcachar, erlegt am 23. iii., trägt dieses zweite Jugendkleid noch vollständig, so dass sich daraus auf eine etwa 4-5 monatige Tragdauer schliessen lässt. Dasselbe wird nunmehr—nach Blanford, *l.c.* p. 243, bei hinterindischen Stücken im März oder April, d. h. im Alter von etwa  $\frac{3}{4}$  Jahren, gegen das

### I. Brutkleid

vertauscht. Es geschieht dies auf dem Wege einer **partiellen Mauser des Kleingefieders**; das Grossgefieder und die Flügeldeckfedern, sowie die Federn des Unterrückens, des Bürzels und die Oberschwanzdecken werden hiervon in der Regel nicht betroffen, ebensowenig wie die Schenkelbefiederung.

Bei diesem Wechsel treten nun, unabhängig von Geschlecht und Localität, zwei extreme Färbungsphasen und alle sie verbindenden Zwischenstufen auf.

(a) Die neuen Federn des Kopfes, Nackens und der Unterseite sind einfarbig schwarz wie bei alten Vögeln (**Paradoxus-Kleid**). Dieser Befund scheint der häufigste zu sein. Belegstücke: ♂, Hainan, 30. ix. 1902; ♂, Formosa, 26. iv. 1907, etc.

(b) Das zweite Jugendkleid wird in ein ihm völlig gleiches erstes Brutkleid vermausert. Die Existenz eines solchen Kleides ist hypothetisch, sie muss durch die Auffindung brütender "Jungvögel" noch erhärtet werden (**Hypothetisches Cairii-Kleid**).

Sehr häufig sind Übergangsstufen zwischen diesen beiden Phasen; bei ihnen sind die neuen Federn der Unterseite, des Oberkopfes und des Nackens teils einfarbig schwarz, teils einfarbig gelbweiss, oder aber es drückt sich der Übergang in der einzelnen Feder aus, die dann im basalen Teil schwarz, im apicalen weiss, oder umgekehrt im basalen weiss, im apicalen schwarz ist, oder ferner schwarz mit gelblichweissen resp. gelblichweiss mit schwarzen Flecken, Längs- oder Querbinden. Solche "gescheckte," nicht mausernde Stücke mochten Blasius zu der Annahme einer Umfärbung ohne Mauser geführt haben.

Bei der nach Ablauf der Brutperiode, d. h. nach 5-6 Monaten, folgenden Mauser ins

### definitive Alterskleid

werden alle Relicte des zweiten Jugendkleides abgestossen und die Hand- und äusseren Armschwinge durch gleichfarbige (stets ungebüderte), die inneren, nach der ersten Mauser schwärzlich braunen Armschwinge dagegen bei den Formen *bengalensis* und *lignator* durch rötlich braune, bei den übrigen Formen durch düster bräunliche ersetzt. Die neuen oberen Flügeldecken besitzen bei *C. b. bengalensis* und *lignator* dunkel rotbraune, nicht mehr strohgelbe Schäfte, die neuen Steuerfedern zeichnen sich durch das Fehlen eines auffälligen hellen Endsaumes aus; die Federn von Oberrücken, Bürzel und die Oberschwanzdecken sind einfarbig schwarz, blaugrün reflektierend, nicht wie früher bräunlich gebändert; zudem besitzen die neuen mittleren Oberschwanzdeckfedern eine beträchtlich geringere Länge; diejenigen des zweiten Jugendkleides pflegen meist bereits bei der Mauser ins erste Brutkleid, anscheinend längere Zeit ohne Ersatz, auszufallen.—Es



mit L (= Lepiduskleid, eine Bezeichnung, die nach der Benennung dieses Stadiums durch Horsfield gewählt wurde); ferner das abnorme zweite Jugendkleid, das dem definitiven Alterskleide gleicht, mit A<sub>1</sub> (= Affiniskleid, abgeleitet von *Centropus affinis* Horsfield, eine dem ausgefärbten Vogel gegebene Benennung); die Bedeutung von A<sub>2</sub> und A<sub>3</sub> ergibt sich hiernach von selbst: Es ist das gleiche Kleid nach der zweiten resp. dritten Mauser. C<sub>1</sub> ist das Cairii-, P das Paradoxuskleid, C<sub>2</sub> das regressive Cairii-Kleid, welches in Ausnahmefällen dem in der Regel den definitiven Zustand bezeichnenden Alterskleid A<sub>3</sub> folgt. Alle Schnittpunkte der Figur, die übereinander liegen, entsprechen gleichen Kleidern; die horizontalen Striche stellen den Zustand der Gefiederruhe, die sie verbindenden Linien den Mauserweg dar, und zwar bezeichnen unter den letzteren die angezogenen Striche eine nachgewiesene, die punktierten eine hypothetische Richtung. t. M. = totale, p. M. = partielle Mauser.

Der normale Mauserweg verbindet die Punkte J L P A<sub>3</sub>.

### 62. *Phoenicophaës curvirostris deningeri* subsp. n.

*Phoenicophaës (Rhinococcyx) curvirostris*, Hartert, p. 552.

♂, Tegal, 1500 f., 4. iii. (*Typus*); ♀, Pik von Buleleng, 3000 f., 21. iii.; ♂, Tegal, 1500 f., 9. iv.

Iris gelb, Füße dunkelgrau, Oberschnabel hellgrün, Unterschnabel schwarz; nackte Augengegend hochrot.

Diese neue Form, die ich meinem verehrten Freund, Herrn Prof. Dr. K. Deninger, dem Leiter der II. Freiburger Molukken-Expedition, widme, steht der typischen, javanischen, sehr nahe, unterscheidet sich jedoch durch helleres Braun an Kehle und Kropf und durch in der Regel helleres Grau an Oberkopf, Kopfseiten und Kinn. 7 Exemplare von Bali mit 7 von Java verglichen.—Bei Javastücken finde ich die Iris als weiss bezeichnet (Prillwitz).

Mehrmals in Kaffeepflanzungen am Gebirgshang beobachtet. Diese Kuckucke pflegen paarweis das Unterholz zu durchstreifen.

*Verbreitung*: Bali.

### 63. *Cyanops armillaris armillaris* (Temm.).

*Cyanops armillaris*, Hartert, p. 551.

2 ♀ ♀, Pik von Buleleng, 3000 f., 15. i.; ♀, Danau Bratan, 2500 f., 17. i.; ♂ ♀, Danau Bratan, 2500 f., 19. i.; ♂ ♀, Danau Bratan, 20. i.; ♂, Gunning Bratan, 4000 f., 21. i.

Iris weissgelb oder weissgrau; Füße olivgrau; Schnabel schwarz, Basis weissgrau.

Gemein in den Kaffeepflanzungen zwischen 2000 und 4500 f. Balinesisch: tapok boa.

*Verbreitung*: Java, Bali.—Auf Sumatra, Borneo und Malakka durch die ziemlich stark differenzierte Form *C. a. henrici* vertreten.

### 64. *Thereiceryx lineatus lineatus* (Vieill.).

*Cyanops lineata typica*, Hartert, p. 551.

♂, Tegal, 1500 f., 10. iv.

Iris braun, nackte Augengegend goldgelb, Füße goldgelb, Schnabel rötlich beinfarben.

Sharpe vereinigt in der *Handlist of Birds*, vol. ii p. 185, die typische Form mit *C. l. hodgsoni* (Bp.); beide sind indessen wohl unterscheidbar; bei *C. l. lineata* sind die Säume der Federn an Kropf, Brust und Vorderbauch in der Regel wesentlich dunkler, und die durchschnittliche Grösse ist beträchtlich geringer, wie die folgenden Messungen zeigen.

Flügelänge in mm.:

*Th. l. lineata*: 113, 116, 117, 117, 122, 122.

*Th. l. hodgsoni*: 120, 123, 124, 125, 125, 126, 130, 130, 130, 131, 132, 132, 134, 134, 135, 135, 136.

Die Art lebt auf Bali in Kaffeepflanzungen.

Verbreitung von *Th. l. lineatus*: Java, Bali.

„ „ *Th. l. hodgsoni*: Himalaya, Assam, Burma, Siam, Cambodja.

In der generischen Einteilung der Capitoniden folge ich Blanford, *Birds Brit. Ind.* vol. iii.

#### 65. *Xantholaema australis* (Horsf.).

Hartert, p. 551.

♂ ♀, Klampowak, 1500 f., 4. iii.

Iris dunkelbraun, Füsse oliv, Schnabel schwarz.

Ich traf auf Bali nur dieses eine Paar, auf einem Fruchtbaum in der Nähe einer Ortschaft. Das ♂ warb in sonderbarer Stellung, mit steil aufgerichtetem Schwanz, um das ♀, dabei beständig seinen einförmigen, wie tuk tuk klingenden Lockruf ausstossend.

Verbreitung: Java, Bali.

#### 66. *Xantholaema rosea rosea* (Dumont).

*Xantholaema rosea*, *Cat. B.* vol. xix p. 57; Hartert, p. 551.

2 ♂♂, Tegal, 1500 f., 2. iii.; ♂ ♀, Tegal, 1500 f., 6. iii.; ♀, Rendang, 1500 f., 13. iii.; ♂, Den Pasar, 17. iii.; ♂, Buleleug, 27. iii.

Iris dunkelbraun, Füsse hellrot, Schnabel schwarz.

Häufig in den Fruchtgärten der Tiefebene und auf den Schattenbäumen der Kaffeepflanzungen bis etwa 2000 f., meist paarweis. Sehr charakteristisch ist der Lockruf, ein oft wiederholtes uk uk uk.

Verbreitung: S.O. Sumatra, Java, Bali.—Auf den centralen Philippinen durch *X. r. intermedia* vertreten, eine Form, die von McGregor im *Man. Philipp. Birds* p. 391 nicht von der typischen unterschieden wird, sich jedoch durch den längeren Schnabel gut kennzeichnet.

Schnabellänge in mm. (mit den Zirkel von der Stirn bis zur Spitze des Oberschnabels gemessen):

Bali: 17·8, 17·8, 18·0, 18·2, 18·3, 18·8, 19·0, 19·2.

Java: 17·8, 18·0, 18·0, 18·5, 18·9, 19·0, 19·0.

Negros: 21·5, 21·5.

Guimaras: 22·5.

San Antonio: 22·1.

#### 67. *Picus vittatus* Vieill.

*Gecinus vittatus*, Hartert, p. 549.

♀, Tjelukan Bawang, 28. iii.

Füsse graugrünlichgelb, Oberschnabel schwarz, Unterschnabel braungelb mit hellgrauer Spitze.



Nur dieses Exemplar beobachtet. Es befindet sich im Beginne der Kleingefiedermauser.

*Verbreitung* : Java, Kangean, Bali, Sumatra (cf. Hagen, *Tijdschr. Ned. Aardr. Gen.* 1890 p. 136), Malakka, Siam, Cambodja, Cochinchina.—Ich vermag kontinentale Stücke nicht von solchen aus Java, Kangean und Bali zu unterscheiden.

### 68. *Dryobates analis* (Horsf.).

Hartert, p. 550.

♀, Buleleng, 13. i. ; ♂, Pik von Buleleng, 17. i. ; ♂, Gunung Bratan, 3500 f., 18. i.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Sehr häufig in der Kulturregion und im Urwald, hier bis 4500 f. beobachtet.

In *Orn. Mber.* 1912 p. 82 trennt Dr. Hesse die *Dendrocopos analis*-Form des Continents und von Bali auf Grund vermuteter grösserer Flügellänge als *D. a. longipennis* von der Javaform ab. ; in seinen "Kritischen Untersuchungen über Piciden" (*Mitt. Zool. Mus. Berlin*, vol. vi Heft 2, 1912, p. 157) gibt er die folgende Masse: Bangkok (terra typ.): 101 ; Bali: 99, 99·5, 99·5, 100 ; Java: 88 (♂ juv.), 91, 92, 93, 93, 96·5, 98 mm.

Meine Bali-Exemplare messen: ♂ 93, 99 ; ♀ 95 mm.

Im Brit. Mus. stellte ich ferner fest:

Java: ♂ 96. ♀ 93, 94.

Madura: ♂ 95.

Lampongs (Sumatra): ♀ 94.

Burma: ♂ 93, 94, 96, 98. ♀ 96, 96, 98, 104.

Cochinchina: ♂ 93, 100. ♀ 96, 101.

Siam: ♂ 98. ♀ 7, 102.

Im Pariser Museum mass ich:

Annam: ♂ 102.

Cochinchina: ♂ 92·5, 96, 97, 97, 97, 97·5, 98. ♀ 92, 94, 96, 97·5.

Siam: ♂ 96, 98, 99, 102.

Es erscheint mir angesichts dieser bedeutenden individuellen Grössenschwankungen fraglich, ob eine Abtrennung der Continentalform auf Grund ihres anscheinend höheren Maximum berechtigt ist, und die Entscheidung könnte erst durch eine grössere Serie aus Java herbeigeführt werden.

*Verbreitung* : Bali, Java, Madura, Sumatra, Burma, Annam, Cochinchina, Siam.

### 69. *Dinopium javanense exsul* Hartert.

*Tiga javanensis*, *Cat. B.* vol. xviii p. 414 ; Hartert, p. 550.

*Tiga javanensis exsul* Hartert, *Nov. Zool.* vol. viii p. 51 (1901—Bali).

♂, Buleleng, 13. i. ; ♂, Buleleng, 12. ii. ; ♂, Buleleng, 6. iv. ; ♀, Djinengdalem, 14. iv.

Iris dunkelbraun, Füsse dunkelgrau oder graugrün, Oberschnabel schwärzlich, Unterschnabel dunkelgrau mit schwärzlicher Spitze.

Das ♀ zeigt den für diese wohl unterschiedene Form charakteristischen roten Nackenfleck.

Flügellänge in mm. : ♂ 130, 131, 134, 134, 139 ; ♀ 130, 132, 134.

Ziemlich häufig in der Kulturregion, seltener im Urwald an alten Stämmen,

hier bis 4000 f. aufsteigend. Eine Bruthöhle, die ich in einer Kokospflanzung bei Buleleng fand, war in einem abgestorbenen Stamm angelegt worden; das Einflugsloch befand sich etwa 130 cm. über dem Boden. Am 12. Februar waren die drei reinweissen Eier noch unbebrütet. Ihre Masse betragen in mm.: 26.6 × 19.5; 26.5 × 19.7; 27.5 × 19.5.

*Verbreitung*: Bali.

Über *Dinopium Rafinesque* 1814 vs. *Tiga Kaup* 1836 vergl. Richmond, *Auk* 1909 p. 250.

70. *Chrysocolaptes strictus* (Horsf.).

Hartert, p. 549.

♂, Tjelukanbawang, 29. iii.

Die Art scheint auf Bali selten zu sein.

*Verbreitung*: Java, Bali, Kangean.

[71. *Thriponax javensis javensis* (Horsf.).]

*Thriponax javensis*, Hartert, p. 552.

*Nor. Zool.* vol. xx p. 318.

*Verbreitung*: Süd-Tenasserim, Malakka, Lingga-Archipel, Natuna, Borneo, Bangka, Sumatra, Java, Bali.

[72. *Pitta cyanura cyanura* (Bodd.).]

*Euchichla cyanura*, Hartert, p. 549.

Nach Doherty nicht selten im Flachland. Ich habe die Art niemals angetroffen.

*Verbreitung*: Java, Bali.

\*73. *Chelidon rustica gutturalis* (Scop.).

1 ♂, 2 ♀ ♀, Buleleng, 4. iv.

Während der vier Beobachtungsmonate häufig in der Kulturzone, zuweilen scharenweise auftretend.

*Wintergast*.

74. *Muscicapula melanoleuca westermanni* Sharpe.

*Muscicapula westermanni*, Hartert, p. 548.

♂, Pik von Buleleng, 3000 f., 15. i.; ♂ juv., Danau Bratan, 2500 f., 17. i.; ♂, Gunung Bratan, 4000 f., 19. i.; ♀, Gunung Bratan, 6500 f., 26. i.; ♂, Gunung Bratan, 4000 f., 27. i.; ♂, Danau Bratan, 3000 f., 29. i.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Dieser hübsche kleine Fliegenfänger ist eine ziemlich häufige Erscheinung im Gebirgswald am Gunung Bratan oberhalb 3000 f. Über seine Lebensweise vergl. *Nor. Zool.* vol. xix p. 325.

*Verbreitung*: Malakka, Borneo, Java, Bali, Lombok, Sumbawa, Flores, Wetter, Timor, Celebes, Batjan, Ceram, Mindanao, Luzon, Negros.

75. *Dendrobiastes hyperythra malayana* (Grant).

*Muscicapula hyperythra*, Hartert, p. 548.

*Dendrobiastes hyperythra malayana*, Stresemann, *Nov. Zool.* vol. xix p. 331.

♂ Gunung Bratan, 4500 f., 21. i.

Iris dunkelbraun, Füße hell graubraun, Schnabel schwarz.

Sehr vereinzelt im Gebirgswald am Gunung Bratan. Über die Lebensweise vergl. *Nov. Zool.* vol. xix p. 327.

*Verbreitung*: Malakka, Sumatra, Borneo, Java, Bali, Lombok, Sumbawa, Flores, Celebes.

Anm.: Hartert führt versehentlich in seiner Liste *Siphia elegans* als auf Bali gesammelt an. Der betreffende Vogel stammt jedoch vom Gunung Ardjuno auf Java.

76. *Hypothymis azurea prophata* Oberh.?

*Hypothymis azurea*, Hartert, p. 549.

*Hypothymis azurea prophata*, Stresemann, *Nov. Zool.* vol. xx p. 294.

♂, Tjelukan Bawang, 26. iii.

Iris dunkelbraun, Füße dunkelgrau, Schnabel dunkelblau, Mundhöhle gelbgrün.

Ich begegnete dieser Art einige Male im Gebüsch an Lichtungen oder im Unterholz lichten Urwaldes der Küstenebene, wo die Vögel laubsängergleich unter munterem Gezwitzscher durch die Zweige schlüpfen.

*Verbreitung*: Malakka, Nieder-Siam (?), Sumatra, Grosse Karimon-Insel, Lingga-Archipel, Borneo, Bangka, Billiton, Java, Bali(?).

77. *Rhipidura javanica* Sparrm.

Hartert, p. 549.

3 Ex. von Buleleng, 11. ii., 12. ii. und 26. iii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Sehr häufig im Gestrüpp des Kulturlandes, bis etwa 3000 f. aufsteigend. Balanesisch: petjét.

*Verbreitung*: Cochinchina, Tenasserim, Malakka, Sumatra, Borneo, Java, Bali.

78. *Rhinomyias umbratilis baliensis* Hart.

*Rhinomyias pectoralis baliensis*, Hartert, p. 549.

♀, Pik von Buleleng, 3000 f., 15. i.; ♂, Kembangsari, 3000 f., 10. iii.; ♀, Tjelukanbawang, 26. iii.

Iris dunkelbraun, Füße grau oder weisslich blaugrau, Schnabel schwarz.

Das neue Material zeigt die Unterschiede dieser Form gegenüber der typischen sehr deutlich:

*Rh. u. umbratilis* (Strickl.): Oberseite warm rötlich braun, am Kopf dunkler und ins olivfarbene übergehend. Unterseite weiss; über die Brust zieht sich ein breites Band aus **blassgrauen** Federn, deren Spitzen, anscheinend am ausgeprägtesten bei jüngeren Vögeln, bei den seitlichen Federn olivbraun gefärbt sind. Zuweilen erscheint bei jüngeren Vögeln dieses Brustband dunkel cremefarben, und nur die Centren der Federn sind trüb grau.

*Rh. u. baliensis* Hart.: Oberseite oliv mit geringer bräunlicher Tönung; das sich über die Brust ziehende Band niemals grau, sondern einfarbig hellbraun, zuweilen ins bräunlich olivfarbene übergehend.

Im Tring-Museum befinden sich jetzt 13 Ex. von *Rh. u. umbratilis* und 9 von *Rh. u. baliensis*. Es zeigt sich, dass der Grössenunterschied der Geschlechter ziemlich beträchtlich ist: 4 ♂♂ von Bali haben eine Flügellänge von 76—80, 5 ♀♀ eine solche von 70—72 mm. Die Nichtbeachtung dieser Tatsache hat offenbar Finsch veranlasst, auf Sumatra das Nebeneinanderbestehen zweier verschiedenen grosser Formen anzunehmen, die er *Rh. pectoralis* und *brunneicauda* nennt.

Am gleichen Orte (*Not. Leyd. Mus.* vol. xxiii p. 40) sucht der genannte Autor die Identität von "*Rhinomyias brunneicauda* (Vorderm.)" mit *Rh. pectoralis baliensis* plausibel zu machen und schlägt den "Vordermanschen" Namen auf Grund seiner "Priorität" vor—gegen alle ehrwürdigen Nomenklaturregeln. Denn Vorderman hat in *Nat. Tijdschr. Ned. Ind.* vol. 50, 1891, p. 460 gar keine neue Art benennen wollen, sondern identifiziert eine *Rhinomyias* aus Billiton fälschlich mit *Hyloterpe brunneicauda* Salvad. und gibt zudem eine Beschreibung des Vogels, aus der deutlich hervorgeht, dass es sich um *Rh. u. umbratilis* und nicht um *Rh. u. baliensis* handelt: "de onderdeelen zijn wit, uitgezondert de borst, die eene grijsachtige kleur heeft en met brownpink getint is."

Die Art ist auf Bali anscheinend nicht häufig; ich traf sie stets vereinzelt, im Unterholz des Urwaldes oder in Kaffeeplantagen, wo sie ein sehr verstecktes, lichtscheues Leben führt.

*Verbreitung*: Bali und vermutlich auch Java.

Anm.: *Trichostoma umbratile* Strickland 1849 = *Alcippe pectoralis* Salvadori 1868 (cf. W. Stone, *Proc. Ac. Nat. Sc. Philad.* 1902 p. 686).

### 79. *Culicicapa ceylonensis ceylonensis* (Swains.).

*Culicicapa ceylonensis*, Hartert, p. 549.

♂, Pik von Buleleng, 3000 f., 15. i.; ♂, Danau Bratan, 2500 f., 20. i.; ♂♀, Danau Bratan, 3000 f., 29. i.

Iris dunkelbraun; Füsse braungelb, rotgelb oder schwarzbraun; Oberschnabel schwarzbraun, Unterschnabel dunkelbraun.

Ziemlich selten im Gebirgsurwald zwischen 2500 f. und 3500 f., in Gesellschaft von Parus und anderen Muscicapiden umherstreichend.

*Verbreitung*: Ceylon und ganz Indien bis zum Himalaya, Burma, China südlich des Tsin-ling-Gebirges, Tenasserim, Malakka, Lingga, Natuna, Borneo, Java, Bali.—Exemplare von Ceylon und dem Himalaya sind vielleicht durchschnittlich etwas grösser als solche aus dem malayischen Archipel.

Flügellänge in mm.:

Ceylon: 63·5, 64·5, 66\*.

Sikkim: 57\*, 58\*, 58\*, 59\*, 60\*, 60, 60·5\*, 60·5\*, 61\*, 61·5, 61·5, 62\*, 62\*, 62·5\*, 62·5\*, 62·5\*, 63\*, 63\*, 64\*, 64, 64\*, 64·5, 65\*.

N.W. Borneo: 55, 56, 56\*, 58<sup>o</sup>, 58\*, 58\*, 58·5, 59, 59·5, 60, 60\*, 61·5, 61·5, 62, 64·5.

Java: 55, 58\*, 60, 60, 60·5, 62.

Bali: 57·5, 59, 60, 61, 61, 61·5, 62.

\*80. *Cryptolopha grammiceps* (Verr.).

♂, Danau Bratan, 2500 f., 17. i. ; ♂, Gunung Bratan, 6500 f., 26. i. ; ♂, Gunung Bratan, 6500 f., 28. i.

Iris dunkelbraun, Füsse graubraun oder olivbraun, Oberschnabel schwarz, Unterschnabel hell orange oder braungelb.

Sehr häufig im Urwald am Gunung Bratan oberhalb 2500 f. Wesen und Ruf erinnert sehr an *Regulus regulus*. Im Gebirge Ost-Balis scheint die Art zu fehlen.

*Verbreitung* : Gebirge von Java und Bali.

[81. *Phylloscopus borealis examinandus* subsp. n.]

*Phylloscopus borealis*, Hartert, p. 544.

Hartert hat bereits in *Nor. Zool.* vol. iii p. 566 auf die Möglichkeit hingewiesen, dass wir es auf den Inseln des Archipels mit zwei überwinterten Formen von *Phylloscopus borealis* zu tun haben, da die von ihm untersuchten ♂♂ von Sumbawa und Bali ein auffallend grosses Flügelmass aufwiesen. Weiteres Material, das in zwischen auf den Kleinen Sunda-Inseln gesammelt wurde, scheint diese Annahme zu bestätigen. Die Wintergäste in diesem Teil des Archipels sind in Durchschnitt grösser und oberseits lebhafter grün gefärbt als typische *borealis*; in letzterem Merkmal stimmen sie mit *Ph. b. xanthodryas* überein, der wiederum durch gelblichere Unterseite und längere erste Handschwinge, welche die Handdecken um etwa 2 mm. überragt (nicht kürzer oder gleichlang ist), von *Ph. b. examinandus* unterschieden ist.

Flügelänge in mm. :

*Phylloscopus borealis borealis.*

<i>Brutvögel</i> :	Oberes Lenagebiet :	♂ 65, 66, 67, 68, 68, 68, 70. ♀ 62.
	Baikalsee :	♂ 67. ♀ 63.
<i>Wintergäste</i> :	Molukken :	♂ 63, 63, 63, 64, 65, 66, 66, 66, 67, 67, 67, 67, 68, 68, 69, 69. ♀ 60, 60, 62, 63, 63, 63, 63, 64, 64, 64, 65, 65.
	Celebes, Saleyer, Sula :	62, 62, 63, 67.
	Philippinen :	61, 61, 62, 63, 67, 67, 67, 67.
	Kalao :	♂ 68, 70.
	Bunguran :	64, 64, 65, 66, 67, 67.
	Malakka :	♀ 62, 64.

*Phylloscopus borealis examinandus.*

<i>Wintergäste</i> :	Bali :	♂ 72, 76 ; sex ? 65.
	Sumbawa :	♂ 74 ; ♀ 65.
	Flores :	♂ 71, 72 ; sex ? 64, 65.
	Alor :	♀ 66, sex ? 65.
	Sumba :	♀ 66.

*Typus* : ♂, Bali, März 1896, W. Doherty coll., im Tring-Museum.

Doherty traf diesen Laubsänger im März häufig im Flachland an. Ich sah

nur wenige Exemplare im Urwald Westbalis zwischen Schwärmen anderer Kleinvögel; ein am 29. iii. erlegtes Stück befand sich stark in der Mauser des Kleingefieders.

### 82. *Phylloscopus trivirgatus trivirgatus* Strickl.

*Cryptolopha trivirgata*, Hartert, p. 549.

2 ♂♂, Pik von Buleleng, 3000 f., 15. i.; ♂, Gunung Bratan, 6500 f., 26. i.; 2 ♂♂, Danau Bratan, 3000 f., 29. i.; ♂, Gunung Bratan, 4000 f., 27. i.; ♀, Danau Bratan, 3000 f., 21. iii.

Iris dunkelbraun, Füße grau oder dunkelgrau, Schnabel schwarz.

Der gemeinste Vogel des Gebirgsurwaldes am Gunung Bratan zwischen 3000 f. und 6500 f. Streicht in grösseren lockeren Schwärmen mit Muscicapiden und *Zosterops* umher, ebenso das Unterholz wie die hohen Kronen durchsuchend. Im Ostgebirge nicht beobachtet.

*Verbreitung*: Sumatra (?), Java, Bali, Lombok, Sumbawa (cf. *Nov. Zool.* vol. xix p. 322).

### 83. *Saxicola caprata fruticola* Horsf.

*Pratincola caprata*, Hartert, p. 544.

*Pratincola caprata fruticola*, Stresemann, *Nov. Zool.* vol. xix p. 321.

♂, Buleleng, 10. ii.; ♀, Batur, 3000 f., 24. ii.; ♀, Kintamani, 4000 f., 22. ii.; ♂, Buleleng, 10. iv.

Iris dunkelbraun, Schnabel und Füße schwarz.

In den Reisfeldern der Küstenzone nur hier und da in einzelnen Paaren, dagegen überaus häufig an den kahlen, nur mit Gräsern bestandenen Gebirgshängen Ostbalis zwischen 3500 f. und 5000 f.: hier Charaktervogel. Ende Februar bei Kintamani in allen Altersstadien beobachtet.—Der Vogel sitzt nach Art unserer Braunkehlchen mit Vorliebe auf Pfählen oder Steinen, die über die Grasfläche hinausragen; fast stets sieht man die Paare beisammen.—Balinesisch: silang djanã.

*Verbreitung*: Inselkette von Java bis Timor (vielleicht bis Babber).

Betreffs *Saxicola* Bechst. 1802 für die Gruppe der Braunkehlchen vergl. Mathews, *Nov. Zool.* vol. xviii p. 20.

### \*84. *Pachycephala melanura fulvotincta* Wall.

♂ juv., Gunung Bratan, 6300 f., 26. i.

Iris dunkel braunrot, Füße blaugrau, Schnabel schwarz.

Die Art, obwohl bisher noch nicht von Bali registriert, wurde hier bereits durch Doherty in einem Exemplar (♀) zwischen 2000 f. und 3000 f. gesammelt. Sie scheint auf der Insel selten zu sein, da ich ihr nur ein einziges Mal—in der Rhododendronzone auf dem Gipfel des Gunung Bratan—begegnet bin. Das Auftreten einer *Pachycephala*-Form aus der *melanura*-Gruppe jenseits der Lombokstrasse ist von zoogeographischem Interesse; solche Formen fehlen auf Java, Sumatra, Borneo und den Philippinen.

*Verbreitung*: Alor, Pantar, Lomblen, Flores, Sumbawa, Bali.

85. *Pachycephala grisola grisola* (Blyth).*Pachycephala grisola*, Hartert, p. 548.

♀, Tjelukan Bawang, 29. iii.

Iris braun, Füsse dunkelgrau, Schnabel schwarz.

Auf Bali anscheinend selten.

*Verbreitung*: Burma, Tenasserim, Malakka, Andamanen, Borneo, Java, Bali, Lombok, Kangean.

5 Exemplare des Tring-Museums von Sirhassen, die vollkommen in der Färbung mit einander übereinstimmen, unterscheiden sich von solchen anderer Herkunft dadurch, dass der Oberkopf viel dunkler grau und der Rücken viel dunkler braun ist, letzterer ohne eine Spur olivfarbener Tönung.—Unter 29 Vergleichsexemplaren von der typischen Form befinden sich drei, die im Ton der Oberseite den Sirhassenstücken sehr nahe kommen—2 von N.W. Borneo, 1 von Lombok—diese unterscheiden sich von

*Pachycephala grisola secedens* subsp. n.

wie ich die neue Form nennen möchte, am deutlichsten durch die etwas helleren, mehr bräunlichen, weniger grauen Stirn- und Zügelfedern.

Vielleicht ist auch die Durchschnittsgrösse von *secedens* etwas beträchtlicher.

Flügelänge in mm.:

Sirhassen: ♂ 84, 84·5; ♀ 82, 84, 84.

Andamanen: 82.

Selangor (Malakka): 80.

N.W. Borneo: 80, 82, 83, 83.

Java: 79, 79, 81, 83, 83.

Bali: ♂ 82; ♀ 81·5, 83.

Kangean: ♂ 81, 85; ♀ 81, 81, 82·5, 83.

Lombok: ♂ 81·5, 82·5, 83·5, 85, 85·5; ♀ 80, 80·5, 81, 81·5.

Zur gleichen Formengruppe gehören:

“*Pachycephala grisola brunneicauda* (Salvad.),” Sumatra.*Pachycephala grisola vandepolli* Finsch, Batu-Inseln.*Pachycephala grisola nesiotis* (Oberh.), Simalur.*Pachycephala grisola winchelli* (Bourne & Worc.), Centrale Philippinen.*Pachycephala grisola whiteheadi* (Sharpe), Palawan.

*Typus* von *P. g. secedens*: ♂, Sirhassen, 21. ix. 1898, A. Everett coll., im Tring-Museum.

86. *Lanius schach bentet* Horsf.*Lanius bentet*, Hartert, p. 547.

♂, 12. i.; ♀, 21. i.; ♀, 3. iv.—alle von Buleleng.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Ein sehr häufiger Vogel der Kulturzone, ganz nach Art unserer heimischen Würger einzeln und paarweis im offenen oder mit niederem Buschwerk bestandenen Gelände der Insektenjagd obliegend und gern auf Telegraphendrähten ruhend. An den waldarmen Hängen des Ostgebirges bis 4000 f. aufsteigend (Kintamani).

*Verbreitung*: Malayische Halbinsel (cf. Robinson, *Handl. Birds Mal. Penins.* 1910, p. 18 Anm.), Inselkette von Sumatra bis Timor.

Die Form scheint die Tendenz zu zeigen, nach Osten zu an Grösse abzunehmen;

auch weisen Vögel von Timor und Alor einen dunkler rostbraunen Ton auf Unter-  
rücken und Bürzel auf als solche von Sumatra.

Flügelänge in mm. (adulte Ex.) :

Sumatra : 91, 92, 92, 95.

Java : 89, 91, 92, 92, 94, 95.

Bali : 90, 90, 91, 91, 91, 92, 93.

Kangean : 86.

Lombok ; 89.

Sumbawa : 86, 86, 88, 91·5, 92, 92.

Alor : 84, 88.

Wetter : 87, 87, 87, 89, 89, 89.

Timor : 85, 87.

Kisser : 86, 86·5, 87, 88·5.

### 87. *Lanius cristatus superciliosus* Lath.

*Lanius superciliosus*, Hartert, p. 548.

♂ ♀, 10. ii. ; ♀, 5. iv. ; ♂, 11. iv.—alle von Buleleng.

Iris dunkelbraun, Füße schwarzgrau, Schnabel schwarz mit hornfarbener Basis  
des Unterschnabels.—Bei dem letzterwähnten alten ♂ ist die weisse Stirnfärbung  
13 mm. breit !

Ziemlich häufig in der Region der Reisfelder. Aufenthalt und Benehmen wie  
bei *Lanius schach bentet*.

*Verbreitung* : Brutvogel in Japan ; scheint hauptsächlich auf der Malayischen  
Halbinsel und den Kleinen Sunda-Inseln von Bali bis Sumba zu überwintern.  
*Lanius cristatus lucionensis* L., der diese Form als Brutvogel in China vertritt,  
besucht auch getrennte Winterquartiere : die Philippinen und Celebes, sowie  
vereinzelt Halmahera und Ceram. Nur auf Malakka scheinen beide Unterarten  
im Winter nebeneinander vorzukommen.

### 88. *Hemipus obscurus* (Horsf.).

Hartert, p. 548.

♂, Pik von Buleleng, 3000 f., 16. i. ; ♀, Danau Bratan, 2500 f., 17. i. ; ♀,  
Gunung Bratan, 4000 f., 20. i. ; ♂, Pik von Buleleng, 2500 f., 21. i. ; ♀, Gitgit,  
2500 f., 1. ii. ; ♀, Gitgit, 1500 f., 21. iii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Häufig im Urwald, von der Küstenebene bis etwa 4000 f. aufwärts, in Gesell-  
schaft von *Parus*, *Pericrocotus* und Muscicapiden umherstreichend. Das Benehmen  
ist völlig muscicapidenartig : sie "schnäppen" ihre Beute im Flug von einem  
exponierten Ast aus.

*Verbreitung* : Malakka, Lingga-Archipel, Borneo, Sumatra, Java, Bali.

### 89. *Graucalus javensis* (Horsf.).

Hartert, p. 548.

♂, Gunung Bratan, 4500 f., 21. i. ; ♂, Kubuabang, 3500 f., 10. iii. ; ♂, Tegal,  
1500 f., 9. iv.

Iris dunkelbraun, Schnabel und Füße schwarz.

Nicht selten in kleinen Gesellschaften im Urwald bis etwa 4500 f., mit Vorliebe



auch in den Schattenbäumen der Kaffeepflanzungen. Durch ihr lautes, papageiartiges Geschrei, das vornehmlich während des raschen Fluges ausgestossen wird, fallen diese Vögel sofort auf.—Balinesisch: kodak-kodak.

*Verbreitung*: Java, Bali.

90. *Pericrocotus peregrinus* (L.).

Hartert, p. 548.

♂ u. ♀ juv., 26. iii.; ♂ u. 2 ♀ ♀, 27. iii.—alle von Tjelukan Bawang.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Bei Tjelukan Bawang häufig in kleinen Trupps auf einzelstehenden Bäumen am Strande. Das junge Exemplar, dessen Steuerfedern noch im Wachstum begriffen sind, wurde am 26. iii. noch gefüttert.

*Verbreitung*: Ceylon, Vorderindien, Nordindien, Burma, Indo-China, Andamanen, Borneo, Java, Bali.

91. *Pericrocotus flammeus exsul* Wall.

*Pericrocotus exsul*, Hartert, p. 548.

♂ ♀, Pik von Buleleng, 3000 f., 15. i.; ♂, Gunung Bratan, 4000 f., 19. i.; ♀, Tjelukan Bawang, 26. iii.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Häufig im Urwald, aber in niederen Lagen spärlicher als im Gebirge. Streicht in kleinen lockeren Gesellschaften umher, meist in bunter Gemeinschaft mit *Muscicapiden* und *Parus*. Ein *Pericrocotus*-Trupp hat in seinem Wesen viel Ähnlichkeit mit einem Schwanzmeisenschwarm im deutschen Winter.

*Verbreitung*: Java, Bali, Lombok.

\*92. *Lalage fimbriata fimbriata* (Temm.).

♂, Danau Bratan, 2500 f., 17. i.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Auf Bali offenbar selten. Ich traf nur ein einziges Mal ein Paar auf einem hohen Urwaldbaum an.

*Verbreitung*: Java, Bali.—Auf Sumatra, Borneo und Malacca durch die nahe verwandte *L. f. culminata* vertreten.

93. *Lalage nigra timorensis* (S. Müll.).

*Lalage timorensis*, Cat. B. vol. iv p. 95; Hartert, p. 548.

♂, Buleleng, 23. i.; ♀, Buleleng, 10. ii.; ♂, Tjelukan Bawang, 26. iii.; ♀, Buleleng, 2. iv.; ♂, Buleleng, 3. iv.

Iris dunkelbraun, Füsse grauschwarz oder schwarz, Schnabel schwarz.

Nicht häufig in der Kulturzone, bis etwa 1500 f. aufsteigend. Den Lieblingsaufenthalt dieser Art bilden freistehende Bäume zwischen Reisfeldern; ihr Betragen hat gewisse Ähnlichkeit mit dem von Würgern.

Ob die Form auf den östlich von Timor gelegenen Inseln durchschnittlich grössere Dimensionen erreicht, kann nur durch grosse Serien festgestellt werden.

Meyer und Wiglesworth haben diese Vermutung in den *Birds of Celebes*, vol. ii p. 429, ausgesprochen.

Flügelänge in mm. (♂♂ ad.):

Bali: 92, 93, 95, 95.

Lombok: 91·5, 92, 93.

Sumbawa: 93, 93, 93, 95, 99.

Sumba: 88, 92, 94, 95, 98.

Savu: 91.

Alor: 92·5.

Wetter: 94, 95·5, 98.

Timor: 92·5, 95, 98 [Meyer].

Djampea: 90.

Kalao: 90

Saleyer: 89.

Süd-Celebes: 90, 90, 90 [M], 92 [M], 92 [M], 93·5, 95 [M].

Binungko: 92, 95.

Kisser: 93·5, 95, 97, 100 [M].

Letti: 93·5, 97.

Moa: 94, 97, 98·5, 100·5.

Luang: 95, 97.

Sermatta: 94·5, 98.

Babber: 95.

Vergl. ferner Finsch, *Not. Leyd. Mus.* vol. xxii p. 251.

*Lalage nigra* (Forster 1781) muss für *Lalage terat* auct. eintreten, cf. Oberholser, *Smiths. Misc. Coll.* vol. 60, No. 7, p. 15 Anm.

#### 94. *Aegithina tiphia scapularis* (Horsf.).

Hartert, p. 546.

♂, Buleleng, 12. ii.; ♂♀, Lumbanan, 600 f., 13. ii.; ♀, Tjelukan Bawang, 25. iii.; ♀, Buleleng, 5. iv.

Iris weissgrau oder weiss, Füsse blaugrau oder dunkelgrau, Oberschnabel schwarz oder grauschwarz, Unterschnabel dunkelgrau mit schwarzer Spitze.

Häufig in der Küstenebene, besonders in der Nähe des Strandes; im Gebüsch oder in dichten Baumkronen lebend und mit Vorliebe in Fruchtgärten sich aufhaltend.—Balinesisch: Kapotjet.

*Verbreitung*: Java, Bali.

#### 95. *Criniger gularis balicus* subsp. n.

*Criniger gularis*, Hartert, p. 546.

♂, Gitgit, 2000 f., 2. ii.; ♂, Buleleng, 5. iv.; sex?, Gitgit, 1500 f., 20. iii.

Iris rotbraun, Füsse hellbraun oder graubraun, Oberschnabel grauschwarz, Unterschnabel hellgrau.

Die balinesische Form steht der javanischen sehr nahe, unterscheidet sich aber durch bräunlichere Ohrdecken, helleren Zügel und bedeutendere Durchschnittsgrösse.

Flügelänge in mm.:

Bali: 100, 102, 103, 106, 108, 110.

West- und Mittel-Java : 91, 93, 94, 95, 95, 96·5, 97, 98, 98 5, 101, 102, 102, 104.

*Typus* : ♂, Gitgit (Bali), 2. ii. 1911, E. Stresemann coll. No. 222.

Vereinzelt in dichtem Gestrüpp der Kulturzone, an den gleichen Localitäten, die *Pycnonotus goiavier analis* bevorzugt. Bei Gitgit stellten sich diese Vögel mit Vorliebe auf einem Baum ein, dessen kleine Beerenfrüchte sie frassen.

*Verbreitung* : Bali.

\*96. *Microtarsus melanocephalos melanocephalos* (Gm.).

♀, Tjelukan Bawang, 30. iii.

Iris dunkelblau, Schnabel und Füße schwarz.

Nur bei Tjelukan Bawang, nahe dem Strande, beobachtet ; hier vereinzelt im dichtesten Dorngestrüpp. Lockruf ein zartes piep piep wie derjenige junger Hühner, die nach Futter rufen.

*Verbreitung* : Ost-Bengalen, Burma, Tenasserim, Malakka, Borneo, Palawan, Sumatra, Java, Bali.

\*97. *Pycnonotus bimaculatus tenggerensis* (v. Oort).

*Crocopsis bimaculatus tenggerensis* van Oort, *Not. Leyd. Mus.* vol. xxxvi p. 46 (1911—Tengger-Gebirge in Ostjava).

♂, Danau Bratan, 2500 f., 16. i.; ♂, Danau Bratan, 2500 f., 17. i.; ♀, Danau Bratan, 2500 f., 20. i.; ♀, Kintamani, 4000 f., 22. ii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Die Balivögel stimmen vollkommen mit 4 ostjavanischen des Tring-Museums (vom Gunung Ardjuno und Tosari) überein und unterscheiden sich von 9 Exemplaren aus Westjava (vom Gunung Gedé und G. Guntur), durch weniger lebhaftes Gelb der Ohrdecken, etwas weniger intensives Grün des Rückens und stumpfere Tönung der gelbgrünen Aussensäume an den Schwingen.

Auf Bali ist die Art häufig im Gebirge zwischen 2500 und 4000 f.; sie bevorzugt Lichtungen im Urwald, Kaffeepflanzungen oder Dickichte in Wasserrissen, wie sie sich an den sonst kahlen Hängen des Ostgebirges finden.

*Verbreitung* : Ostjava, Bali.

98. *Pycnonotus goiavier analis* (Horsf.).

*Pycnonotus analis*, Hartert, p. 546.

♂, Marga, 1000 f., 20. iii.; ♂ u. juv., Buleleng, 6. iv.

Iris dunkelbraun, Schnabel und Füße schwarz.

Der gemeinste Vogel der Kulturzone, überall dort in grosser Anzahl, wo sich Gestrüpp findet. Im waldarmen Ostgebirge steigt die Art bis 3000 f. empor und kommt bei Batur (3000 f.) neben *Pycnonotus bimaculatus tenggerensis* vor, der ihn im übrigen vertikal vertritt.—Die ersten belegten Nester fand ich kurz nach dem Einsetzen der Trockenperiode, am 5. März. Sie werden nach Goldammerart in Hecken und Dornbüschen angelegt und sind dort leicht zu finden.

(a) Tamblang, 5. iii., mit 2 Eiern; ziemlich lose aus Zweigstückchen, Ranken und Fasern gebaut, mit mässig stark vertiefter Mulde. Am Nestrand sind Fetzen einer Schlangenhaut und Reste von Puppenkokons befestigt. Höhe 60, Breite 100, Napftiefe 45, Napfweite 60 mm.

(b) Tjelukan Bawang, 29. iii., mit 2 Eiern; sehr sorgfältig aus dünnen

Zweigchen und hellbraunen Fasern, die vermutlich von einer Palmenart stammen, gedreht. Höhe 50, Breite 110, Napftiefe 30, Napfweite 60 mm.

(c) Tjelukan Bawang, 29. iii., mit 2 Eiern; sehr lose aus dem gleichen Material wie *b* gebaut. Höhe 50, Breite 120, Napftiefe 35, Napfweite 60 mm.

(d) Tjelukan Bawang, 25. iii., mit 2 Eiern; ziemlich fest und dicht aus Zweigstückchen und Ranken erbaut und mit Grasstielen ausgelegt. Höhe 65, Breite 100, Napftiefe 35, Napfweite 60 mm.

Das Gelege scheint in der Regel aus 2 Eiern zu bestehen; dieselben messen in mm.:

(a) 23·5 × 17·2; 23·6 × 17·1.

(b) 23·6 × 16·9; 23·9 × 16·5.

(c) 24·3 × 17·7.

(d) 25·7 × 16·2.

(e) 22·2 × 16·5; 23·9 × 16·8.

Die Eier sind von weisser, schwach rötlich getönter Grundfarbe, mit zahlreichen blassgrauen Schalenflecken versehen und über und über besät mit dunkel bräunlichroten Punkten und Flecken, die nach dem stumpfen Pol zu dichter zu stehen pflegen und sich dort bei zwei Eiern zu einem Kranz anordnen. Bei dem Ei *d* sind die Flecken blasser, feiner und fast gleichmässig über das Ei verteilt.

Über Nest und Eier dieser Art aus Java vergl. A. B. Meyer, *Sitzungsber. u. Abh. Nat. Ges. Isis* 1884 p. 45.

*Verbreitung*: Indo-China, Tenasserim, Malakka, Borneo, Bangka, Billiton, Sumatra, Java, Kangean, Bali, Lombok.

#### 99. *Pomatorhinus montanus montanus* Horsf.

*Pomatorhinus montanus*, Hartert, p. 544.

3 Ex., Pik von Buleleng, 2500—3000 f., 16. i.; ♀, Danau Bratan, 2500 f., 20. i.; ♂, Gunung Bratan, 4500 f., 21. i.

Iris gelbweiss, Füsse braunoliv oder graunoliv, Schnabel dunkelgelb, Basalhälfte der Oberschnabelfirste schwärzlich.

Sehr häufig im Urwald am Gunung Bratan, zwischen 2500 und 5000 f., zuweilen in kleinen Gesellschaften auftretend, die zänkisch und laut lärmend durchs Unterholz schlüpfen. Der Ruf dieser Art ist sehr leicht kenntlich.

*Verbreitung*: Java, Bali.—*P. borneensis* sowie *P. schisticeps* und dessen nächste Verwandte dürften als Angehörige der gleichen Formengruppe anzusehen sein.

Flügelänge in mm.:

Bali: 85, 85, 85·5, 90, 90, 93, 94, 96.

Ost-Java: 86, 87, 89, 94.

West-Java: 87, 88.

#### 100. *Turdinus sepiarius* (Horsf.).

Hartert, p. 544.

♂, Tjelukanbawang, 26. iii.

Iris dunkel rotbraun, Füsse hellgrau, Oberschnabel grauschwarz, Unterschnabel hellgrau.

Ich traf diese Art vereinzelt im dichten Unterholz des Urwaldes der Küsten-

ebene an, wo sie bei Eintritt der Abenddämmerung laut lärmend dicht über dem Boden umherfliegt. Dohertys Exemplar stammt aus einer Höhe von 2000—3000 f.

*Verbreitung*: Bali, Java, Malakka (cf. Hartert, *Nov. Zool.* 1902 p. 563).

101. **Cyanoderma melanothorax** (Temm.).

Hartert, p. 544.

♂, Danau Bratan, 2500 f., 19. i.; ♀, Gunung Bratan, 4000 f., 27. i.; ♂, Gitgit, 2000 f., 2. ii.

Iris dunkelbraun; Füße gelblich grau, grün- oder grau-oliv; Schnabel dunkelgrau, Oberschnabel dunkler.

Nicht selten, meist zu mehreren, an lichten Stellen des Gebirgsurwaldes in dichtem Buschwerk, das sie zaunkönigartig durchschlüpfen. Der Ruf ist ein lautes Schnurren.

*Verbreitung*: Java, Bali.

\*102. **Myiophoneus cyaneus** (Horsf.).

♂ ♀, Batur, 3000 f., 1. iii.

Iris dunkelbraun, Schnabel und Füße schwarz.—Vollkommen mit einer Serie aus Westjava übereinstimmend. Flügel: ♂ 145, ♀ 135 mm.

Auf Bali anscheinend selten. Ich beobachtete die Art nur ein einziges Mal in einer Kaffeepflanzung.

*Verbreitung*: Java, Bali.

[103. **Brachypteryx leucophrys** (Temm.).]

Hartert, p. 544.

*Verbreitung*: Java, Bali, Lombok, Sumbawa, Timor (Hellmayr in litt.).

[104. **Enicurus leschenaulti leschenaulti** (Vieill.).]

*Enicurus leschenaulti*, Hartert, p. 544.

Ich beobachtete diese Art mehrmals bei Gitgit und einmal bei Tjelukanbawang an rasch fließenden Gebirgsbächen. Der Ruf ist dem Pfiff von *Alcedo ispida* ähnlich und wird gleichfalls während des raschen Fluges ausgestossen, wobei der Vogel niedrig über dem Wasser dahinschiesst. Man sieht die Art häufig bachstengelgleich auf grossen Blöcken laufen, die aus dem Wasser hervorragen, dabei wie *Motacilla boarula* mit dem langen Schwanz wippend; doch hält sie sich zuweilen auch im dichten Ufergebüsch auf.

*Verbreitung*: Java, Bali.—In Sikkim, Bhutan, Burma und dem nördlichen Tenasserim durch *E. l. indicus*, in Borneo durch *E. l. borneensis* vertreten.

\*105. **Megalurus palustris** Horsf.

♂, Kutadalem, 4500 f., 2. iii.; ♂, Tjelukanbawang, 31. iii.

Iris hellbraun resp. lebhaft braun; Füße hellbraun resp. bräunlich fleischfarben; Oberschnabel braunschwarz, Unterschnabel dunkelgrau.—Flügel 95, 98 mm.

Einige Male beobachtete ich diese Art in offenem Gelände in kleinen Trupps, die von Busch zu Busch zogen.

*Verbreitung*: Nord-Indien und Burma; Java und Bali; Philippinen.—Continentale Stücke scheinen sich durch einen in der Regel dunkel rötlichbraunen Ton der Kopfplatte auszuzeichnen, die bei Exemplaren vom Archipel bräunlich sandfarben zu sein pflegt. Doch findet man nicht selten auch das umgekehrte Verhalten.

\*106. *Cisticola exilis* Vig. & Horsf.

2 ♂♂, Buleleng, 3. iv.

Iris dunkelbraun, Füße blass fleischfarben, Oberschnabel dunkelbraun, Unterschnabel hell gräulich fleischfarben mit dunkler Spitze.

Die Art kommt an den gleichen Localitäten wie *Cisticola cisticola fuscicapilla* vor; sie ist häufig in den Reisfeldern der Küstenebene und in den weiten Allangallang-Flächen des Ostgebirges, hier bis 5000 f. aufsteigend.

Es ist seit Oates (*Birds Brit. Burma*, vol. i, März 1883, p. 117) bekannt, dass wir bei *Cisticola exilis* vier verschiedene Kleider zu unterscheiden haben: (1) dasjenige des ♂ zur Brutzeit mit einfarbigem hell rostbraunem Oberkopf und kurzem Schwanz; (2) das Brutkleid des ♀, das sich von dem gleichzeitigen des ♂ hauptsächlich durch die dunklen Federcentren des Oberkopfes und den etwas längeren und stärker gestuften Schwanz unterscheidet; (3) das ausserhalb der Brutzeit getragene sog. Winterkleid, in dem bei beiden Geschlechtern der Oberkopf grau erscheint und der Schwanz eine um vieles beträchtlichere Länge besitzt; (4) das Jugendkleid mit gestreiftem Oberkopf und gelblicher, nicht weisslicher oder röstlicher, Unterseite.

Wir kennen im Archipel keine zweite weitverbreitete Art, die durch ihr Kleid so deutlich ihre Brutzeit verriete, und beim Vergleich der Stücke, die im gleichen Monat auf verschiedenen Inseln erlegt wurden, ergeben sich einige bemerkenswerte Tatsachen.

a. *Es befinden sich im vollen Brutkleid.*

Victoria: 15. xii., ♀; 15. i., ♂—Nord-Queensland: 30. xii., ♂.

New South Wales: 25. vi., ♂—Nord-Australien: 24. i., ♂; 9. u. 17. xii., ♂.

Brit. Neu-Guinea: 3. ix., ♂; 1. vii., ♂; 3. xii., ♀; 30. xii., ♂; 31. xii., ♀.

Deutsch Neu-Guinea: 17. x., ♀; 23. i., ♀.

Neu-Hannover: 11. ii., ♂.

Goodenough-Insel: 11. xii., ♂.

Bura: x., ♂ ♀; 9. i., ♂; 25. ii., 2 ♀ ♀; 11. ii., ♂; iii., ♂.

Celebes: Indrulaman, x., ♂.

Kalidupa: 1., 2., 4., 9. i., ♂♂.

Sermata: 18. vi., ♀ (stark abgenutzt).

Flores: xi., 2 ♂♂.

Bali: 3. iv., 2 ♂♂.

Lombok: vi., ♀ (stark abgenutzt).

Manilla: 5. iv., ♂.—Samar: 14. vi., ♂.—Panay: 14. i., ♀.—Luzon: vii., ♂.

Sulu-Archipel: 23., 30., 30. iv., ♂♂.

b. *Es befinden sich im vollen "Winterkleid."*

Brahmagherries (Indien): 11. u. 14. ii., ♂♂.—Bengalen: 10. ii., ♀.

Timor: viii. (ganz frisch).

Leti: 2., 4., 8. xi.; 17., 23., 23., 24. xii.

Roma : 17., 31. vii. ; 9., 11., 11., 14., 15. viii.

Babber : 13. viii. ; 4., 15. ix.

Moa : 28. xi.

Neupommern : vi., ♂.

Brit. Neu-Guinea : 14. vi., ♀.

c. *Es mausern aus dem Winterkleid ins Brutkleid.*

Nord-Australien : 15. xi., ♂ (Kleingefieder [K] vermausert, centrales Steuerfederpaar soeben erneut, aber noch nicht ausgewachsen [mausert], die übrigen Steuerfedern [St.] sind noch die Winterkleides ; 5. Handschwinge [von aussen] mausert).

Brit. Neu-Guinea : 5. vii., ♀ (K. vermausert, St. noch nicht vermausert) ; 6. vii., ♀ (K. verm., alle St. fehlen bis auf 4 alte) ; 11. vii., ♀ (K. verm., St. noch nicht).

Deutsch Neu-Guinea : 17. x., ♂ (K. verm., drittes St.-Paar von aussen mausert).

Celebes : Dongala, viii., ♂ (K. verm., äusserstes St.-Paar und die beiden äussersten Handschwingen [H.] mausern).—Bonthain-Pik : viii., ♂ (K. verm., centr. St.-Paar in d. Blutkielen, ebenso das 6. H.-Paar).—Indrulaman : ix., ♂ (K. u. St. verm. ; 1., 2. u. 3. H. mausern).—Tawaya : ix., ♂ (K. verm., centr. St.-Paar in den Blutkielen).

Kalidupa : 4. i., ♀ (K. und St. verm., 2. H.-Paar mausert).

d. *Es mausern aus dem Brutkleid ins Winterkleid.*

Timor : vii. (K. u. St. verm. ; die äussersten H. mausern).

Nord-Australien : 21. v., ♂ (K. und St. verm. ; die 2 äussersten H. mausern).

Buru : 25. ii., ♀ (K. noch im Brutkleid ; centr. St.-Paar in d. Blutkielen der Winterfedern).

Roma : 6. viii. (in vollem Winterkleid, nur die Federn des Oberkopfes im Wechsel, die nachwachsenden mit schwarzen Centren) ; 25. viii. (in vollem Winterkleid, nur das Kehlfieder und die 1. u. 2. H. noch mausernd).

e. *Es befinden sich im ersten Jugendkleid.*

Lombok, vi. ; Buru, 11. und 26. ii.

f. *Es befindet sich im Jugendkleid und mausert die Steuerfedern.*

N.W. Australien : 17. iii. (3. St.-P. von aussen in den Blutkielen).

Zur Beurteilung der vorstehend verzeichneten Mauserstadien sei bemerkt, dass *Cisticola exilis* nach typischer Passerinenart die Steuerfedern centrifugal, die Handschwingen descendent wechselt.

Diese Daten lassen, so spärlich sie auch sind, doch schon einige Wahrscheinlichkeitsschlüsse auf die ungefähre Ausdehnung der Brutzeit in verschiedenen Gebieten zu :

Australien : November—März.

Neu-Guinea und Bismarck-Archipel : etwa Juli oder August—Februar (vergl. Dahl, *Mitt. Zool. Mus. Berlin*, vol. i, Heft 3, p. 221 ; Heinroth, *J.f. O.* 1903 p. 87).

Buru : Oktober—Februar oder März.

Inseln zwischen Babber und Timor (incl.) : Jan. (?)—Juni.

Flores bis Bali : vielleicht November—Juni.

Philippinen und Sulu-Archipel : Januar—Juli.  
Celebes und Kalidupa : Oktober—(?)  
[Brit. Indien : Mai—November, cf. Oates, *l.c.*, p. 117.]

\*107. *Cisticola cisticola fuscicapilla* Wall.

♂, Buleleng, 12. ii.  
Iris hellbraun, Füße hell gelbbraun, Oberschnabel schwarz, Unterschnabel hellbraun.—Brutkleid.

*Verbreitung* : Inselkette von Bali und Kangean bis Moa ; Celebes, Peling ; Java (?)

108. *Orthotomus sepium sepium* Horsf.

*Orthotomus sepium*, Hartert, p. 545.

♀, Buleleng, 11. ii.  
Iris und Füße hell braungelb, Oberschnabel braun, Unterschnabel gelblich.  
Häufig im Gestrüpp der Kulturzone, bis etwa 2000 f. aufsteigend.

*Verbreitung* : Java, Madura, Bali, Lombok. Auf Sumatra, Borneo und Malacca durch die nahestehende Form *Orthotomus sepium cineraceus* Blyth vertreten.

\*109. *Phyllergates cucullatus cucullatus* (Temm.).

*Nov. Zool.* vol. xix p. 341.

♀ (?), Danau Bratan, 2500 f., 18. i.  
Nicht selten im Gebiet des Gunung Bratan zwischen 2500 und 6500 f., paarweis in dichtem Gestrüpp oder zwischen den verworrenen abgestorbenen Ästen und Zweigen gestürzter Urwaldriesen lebend. Die Art, einer der besten und auffälligsten Sänger der Gebirgsregion, sang auf Bali ganz die gleiche Strophe wie im Gebirge von Perak. Der Warruf besteht in einem lauten, raschen, zaunkönigartigen Schnurren.

*Verbreitung* : Malakka, Sumatra, Borneo, Luzon, Java, Bali.

110. *Prinia familiaris* Horsf.

Hartert, p. 545.

1 Ex., Buleleng, 11. ii. ; ♀, Buleleng, 12. ii. ; 1 Ex., Buleleng, 26. iii. ; ♂, Tjelukanbawang, 27. iii. ; ♀, Buleleng, 3. iv.

Iris rotbrann (ad.) oder hellbraun (juv.), Füße blass fleischfarben, Schnabel schwarz, bei juv. der Unterschnabel hell gelbbraun.—Gemein in Buschdickichten der Küstenzone. Schöner lauter Gesang. Der Schwanz wird häufig steil aufgerichtet und fächerförmig ausgebreitet, wie bei *Troglodytes*.

Am 25. und 29. iii. fand ich 2 Nester bei Tjelukanbawang. Sie waren in dichtem Gesträuch verborgen und besitzen die folgende Gestalt :

Nest *a* sehr tief sackförmig, Mulde 83 mm. tief und 45 mm. breit, oben offen, aber durch ein breites Blatt überdacht ; Wand dünn, sehr sorgfältig aus Grasrispen und wenigen feinen Würzelchen verflochten. Das Nest hängt in einem grosslaubigen Zweig, dessen Blätter rings an die Nestwand "angenäht" sind, dasselbe haltend und völlig verbergend.

Nest *b* aus den gleichen Materialien geflochten wie das vorige, aber aussen



nicht mit Blättern vernäht. Gestalt die eines mässig tiefen Beutels mit seitlichem Eingang.

Gelege *a* : 3 Eier. Dimensionen : 17·7 × 12·6 ; 17·3 × 12·7 ; 17·1 × 12·5 mm.

Gelege *b* : 2 Eier. Dimensionen : 18·4 × 12·4 ; 17·7 × 12·8 mm.

Die Eier sind sehr dünnwandig, besitzen einen matten Glanz und sind von zarter, sehr hell blauer Farbe, ohne Fleckung.

Über Nester und Eier dieser Art vergl. ferner Bernstein, *J. f. O.* 1859 p. 263.

*Verbreitung* : Bali, Java, Sumatra (?).

\*111. **Horeites montana** (Horsf.).

♂, Danau Bratan, 2500 f., 19. i.

Iris dunkelbraun, Füsse hell gelbbraun, Oberschnabel schwarz, Unterschnabel gelbrot.—Das Exemplar zeigt völlige Übereinstimmung mit Stücken von Java (Gnung Ardjuno, 7500—10,000 f., und Tosari, 6000 f.; cf. Hartert, *Nor. Zool.* vol. iii p. 538) und Lombok. Auf letztgenannter Insel wurden 2 Stück durch Doherty in 4000—6000 f. Höhe gesammelt, die in Harterts Liste in *Nor. Zool.* vol. iii pp. 555—65 nicht enthalten sind.

Nicht selten im Gebiet des Gnung Bratan zwischen 2500 und 4000 f. im Gebüsch an Lichtungen, besonders im Bambusgestrüpp. Der Vogel trägt mit heller lauter Stimme, die ganz an die eines *Phylloscopus* erinnert, sehr exact die Strophe von *Fringilla coelebs* vor. Solitär lebend.

*Verbreitung* : Java, Bali, Lombok.

112. **Copsychus saularis amoenus** Horsf.

*Cat. B.* vol. vii p. 66 ; Hartert, p. 544.

♂, 12. i. ; ♂, 13. i. ; ♀, 11. iv.—alle von Buleleng.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Die Balivögel sind, wie Hartert bereits erwähnt hat, typische *amoenus* mit vollkommen blaumetallischer (♂) resp. dunkelaschgrauer (♀) Unterseite, nur die hintersten Flankenfedern und die Unterschwanzdecken weisen teilweise weisse Spitzen auf. Ich habe auf Bali kein einziges Exemplar mit weissem Bauch gesehen.

Ein häufiger Vogel, vorzugsweise in den Ortschaften und in Fruchtgärten. Bis etwa 2000 f. aufsteigend.—Balinesisch : tulung-tulung.

*Verbreitung* : Borneo, Ost-Java, Bali.—Die dunkelbäuchige Form ist auf Java offenbar auf den Osten beschränkt, während *C. s. musicus* über die ganze Insel verbreitet zu sein scheint, da Bartels (*Nat. Tijdschr. Ned. Ind.* vol. 51 p. 153) sie auch für Soerabaja angibt. Bastarde beider oder Übergangsstadien sind auf Java und Borneo anscheinend häufig.

[113. **Geocichla citrina rubecula** Gould.]

*Geocichla rubecula*, Hartert, p. 543.

*Verbreitung* : Java, Bali.

[**Turdus** sp. ?.]

Eine Drossel mit dunkelbrauner Oberseite und hellerer, offenbar dunkel gefleckter Unterseite beobachtete ich mehrfach im Gebirgswald am Gnung Bratan zwischen 3000 und 6500 f. ; besonders häufig war sie in den Rhododen-

dronbüschen auf dem Gipfel des genannten Berges, doch vermochte ich zwei erlegte Stücke im Pflanzengewirr des Steilhanges nicht zu finden. Vielleicht handelt es sich um *Turdus varius horsfieldi* (Bp.), der von Java und Lombok bekannt ist.

114. *Artamus leucorhynchus* (L.) subsp.

*Artamus leucogaster*, Cat. B. vol. xiii p. 7; Hartert, p. 547.  
Nov. Zool. vol. xx. p. 291.

♀, Buleleng, 12. i.; ♀, Buleleng, 15. i.  
Iris dunkelbraun, Füße dunkelgrau, Schnabel blaugrau.  
Sehr häufig in der Kulturzone bis etwa 2500 f.

115. *Parus major cinereus* Vieill.

*Parus atriceps*, Hartert, p. 545.

♂, Pik von Buleleng, 15. i.; ♂ ♀, Gunung Bratan, 4000 f., 30. i.  
Iris dunkelbraun, Füße graublau oder hellgrau, Schnabel schwarz.  
Häufig in den Kronen der Urwaldbäume, von der Küstenzone bis 6500 f.  
Viele Stimmäusserungen dieser Form gleichen vollkommen denjenigen von *Parus major major*.

*Verbreitung*: Himalaya von Simla bis Bhutan, Assam, Burma, Tenasserim, Malacca, Java, Bali, Lombok, Sumbawa, Flores, Alor, Sumba.

\*116. *Zosterops palpebrosa neglecta* Seeb.

Nov. Zool. vol. xix p. 346.

♀, Gunung Bratan, 6500 f., 26. i.; ♂, Gunung Bratan, 6500 f., 28. i.; ♂, Batur, 3500 f., 24. ii.; ♀, Kintamani, 4000 f., 25. ii.; 1 Ex., Gunung Batur, 3500 f., 26. ii.  
Iris weiss oder weissgrau, Füße dunkelgrau oder schwarzgrau, Oberschnabel schwarz, Unterschnabel hellgrau mit schwarzer Spitze.

Charaktervogel der Kasuarinenwäldungen (*Casuarina montana* Leschen.); als solcher gemein im Vulkangebirge des Ostens bei Kintamani und am Gunung Batur, von etwa 3500 f. an aufwärts, in grossen Flügen zwitschernd von Baumkrone zu Baumkrone ziehend; im Centralgebirge traf ich ihn nur auf dem mit Kasuarinen gekrönten Gipfel des Gunung Bratan, bei 6500 f.

*Verbreitung*: Gebirge von Ost-Java, Bali, Lombok und Flores, oberhalb 3000 f.

117. *Oreosterops javanica elongata* subsp. n.

*Zosterops fallax*, Hartert, p. 546.

♂, Danau Bratan, 2500 f., 17. i.; 2 ♂♂, 2 ♀♀, Gunung Bratan, 4000 und 6500 f., 20., 27., 28. und 30. i.

Iris lebhaft braun oder dunkel rotbraun, Füße grauoliv, Schnabel schwarz.

In der Färbung stimmen die Balivögel vollkommen mit *O. j. frontalis* (Rehb.) überein; sie unterscheiden sich jedoch durch auffallend längere Schnäbel.

Flügelänge in mm.:

West-Java: 60, 60·5, 62, 62, 62·5, 63, 63.

Bali: 62, 62, 62·5, 64, 64, 66.

Schnabellänge in mm. (vom Beginn der Stirnbefiederung an mit dem Zirkel gemessen):

West-Java: 10·2, 10·3, 10·5, 10·5, 10·8, 10·8, 10·8, 11·0.

Bali: 11·5, 12·0, 12·0, 12·0, 12·0, 12·0, 12·2, 12·8.

*Typus*: ♂, Gunung Bratan (Bali), 4000 f., 27. i. 1911, E. Stresemann coll. No. 211.

Ich möchte "*Zosterops javanica*" und "*Zosterops frontalis*" als geographische Varianten **einer** Art ansprechen, obwohl sie auf einigen Bergen West-Javas nebeneinander vorkommen; es ist indessen die letztere Form offenbar ganz auf den Westen beschränkt, während die erstere im Gebirge der Osthälfte häufig ist, im Westen dagegen nur vereinzelt aufzutreten scheint—was dafür sprechen dürfte, dass sie erst neuerdings in das Gebiet von *frontalis* eingewandert ist. Will man sie jedoch spezifisch trennen (cf. van Oort, *Not. Leyd. Mus.* vol. 34 p. 48), so muss dies folgerichtig auch mit "*Copsychus musicus*" und "*Copsychus amoenus*" geschehen, da sie im Osten Javas nebeneinander leben (vide antea).

Die Art ist auf Bali ein sehr häufiger Gebirgsvogel von 3000 f. an aufwärts. Sie hält sich, im Gegensatz zu den Arten des Genus *Zosterops* s. s., die ich zu beobachten Gelegenheit hatte (*Z. neglecta*, *stalkerii*, *foghaënsis*, *buruensis*, *obstinata*), mit Vorliebe in dichtem Buschwerk auf, das sie unter trägen Sprüngen durchsucht. Ihre Stimmäusserungen sind ziemlich mannigfach: der Gesang erinnert entfernt an den von *Acanthis carduelis*, der Lockruf ist ein finkenartiges pink, im Flug lässt sie einen klirrenden Ruf hören.—Im Kropf fand ich Reste von Körnernahrung.

*Verbreitung*: Bali.

\*118. *Dicaeum minullum sollicitans* Hart.

2 ♂♂ (mit stark entwickelten Hoden), Gitgit, 2000 f., 13. ii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Die beiden Stücke stimmen mit dem Typus und einem zweiten Exemplar des Tring-Museums von West-Java ziemlich gut überein, unterscheiden sich aber dadurch, dass die Zügelgegend nicht gelblich weiss gefärbt ist, sondern beim einen Exemplar trüb grauweiss, beim anderen hell oliv und kaum von der Färbung des Oberkopfes verschieden. Doch zeigen sich nach van Oort (*Not. Leyd. Mus.* vol. 34 p. 50) auch Javaner hierin variabel. Flügel 42·5 und 46·5 mm.

Ich fand diese Art nur bei Gitgit in Fruchtgärten. Ein drittes Exemplar, das ich schoss, war für eine Conservierung zu stark beschädigt.

*Verbreitung*: Java, Bali.

\*119. *Dicaeum sanguinolentum* Temm.

♂, Gunung Bratan, 4000 f., 29. i.; ♂, Gitgit, 2000 f., 18. ii.; ♂, Gunung Bratan, 4000 f., 21. iii.; ♂ ♀, Tegal, 1500 f., 4. iii.

Iris dunkelbraun, Füße und Schnabel schwarz.—Ganz mit Exemplaren aus Java übereinstimmend.

Sehr häufig im Gebirge zwischen 2500 und 4500 f., seltener tiefer hinabsteigend. Mit Vorliebe besuchen diese Vögel eine parasitäre Pflanze, die kleine runde Büschel von mistelartigem Aussehen in den Ästen verschiedener Bäume, besonders in denen von *Casuarina montana*, bildet.

*Verbreitung*: Java, Bali, Flores (cf. Hartert, *Nov. Zool.* vol. iv p. 518).

120. *Dicaeum flammeum* (Sparrm.).

Hartert, p. 545.

♂ ♀, Gitgit, 2000 f., 2. ii.; ♀, Buleleng, 12. ii.; ♂, Gitgit, 2000 f., 13. ii.; ♂, Tjelukan Bawang, 27. iii.; ♂, Buleleng, 4. iv.

Iris dunkelbraun, Füße schwarz, Oberschnabel schwarz, Unterschnabel hellgrau mit schwarzer Spitze.

Vertritt *Dicaeum sanguinolentum* in der niederen Zone, bis etwa 2500 f. aufwärts, und ist hier eine sehr häufige Erscheinung, zumal in Fruchtgärten.

*Verbreitung*: Java, Madura, Kangean, Bali.

Flügelänge in mm. (♂ ♂ ad.):

Java: 52·5, 53, 53·5, 54, 54, 54.

Kangean: 51·5, 52·5.

Bali: 53·5, 53·5, 54, 54, 54·5, 54·5, 55·5, 56·5.

[121. *Dicaeum trigonostigma trigonostigma* (Scop.)]

*Dicaeum trigonostigma*, Hartert, p. 545.

Doherty sammelte ein ♂ zwischen 2000 und 3000 f.

*Verbreitung*: Cochinchina, Burma, Malakka, Lingga, Bunguran, Borneo, Sumatra, Java, Bali.

122. *Cinnyris ornata ornata* Less.

*Cinnyris pectoralis*, Hartert, p. 545.

♂ ♀, Buleleng, 12. i.; ♂, Buleleng, 12. ii.; ♂ ♀, Tjelukanbawang, 25. iii.

Iris dunkelbraun, Schnabel und Füße schwarz.

Gemein in der Kulturregion, vor allem in Fruchtgärten und auf blühenden Büschen. Man sieht die Art meist paarweis. Ein ♂ vom 12. ii. hatte stark entwickelte Hoden.

*Verbreitung*: Malakka, Lingga, Natuna, Borneo, Sulu-Archipel (1 ♂, coll. Guillemard, im Tring-Museum), Sumatra, Java, Kangean, Bali, Lombok, Sumbawa, Flores.

Anm. Der Name *Cinnyris pectoralis* (Horsf.) ist durch *C. pectoralis* Vieillot 1819 präoccupiert; cf. Oberholser, *Smiths. Misc. Coll.* vol. 60, No. 7, p. 18 Anm.

123. *Arachnothera affinis affinis* (Horsf.).

*Arachnothera affinis*, Hartert, p. 545.

♂, Danau Bratan, 2500 f., 20. i.; ♀, Gunung Bratan, 4500 f., 20. i.; ♂, Pik von Buleleng, 2500 f., 21. i.

Iris lebhaft braun, Füße hellbraun oder dunkel braunrot, Oberschnabel schwarz, Unterschnabel schwärzlich rot.

Nicht selten im Gebirgsurwald am Gunung Bratan.

*Verbreitung*: Java, Bali.

124. *Anthreptes malacensis malacensis* (Scop.).

*Anthreptes malacensis*, Hartert, p. 545.

♂, Lumbanan, 600 f., 2. ii.; ♀, Buleleng, 12. ii.; ♂, Tjelukan Bawang, 31. iii.

Iris rotbraun, Füße grauoliv oder schwarzgrau, Oberschnabel schwarz, Unterschnabel dunkelbraun.

In Kokospflanzungen nicht selten, wo dieser Vogel die Blütenstände der Palmen besucht.

*Verbreitung*: Cochinchina, Siam, Tenasserim, Malakka, Lingga- und Natuna-Archipel, Borneo, Sumatra, Java, Kangean, Bali.

Flügelänge in mm. (♂♂ ad.):

Malakka: 62·5, 63, 64·5, 66, 66, 66, 69.

Singapore: 67.

Bunguran: 67, 68, 69, 70.

Sirhassen: 68, 68·5, 69·5, 71.

Lingga: 67·8, 70.

Borneo: 66, 67·5, 68, 68, 68.

Labuan: 67.

Java: 64, 65, 66·5, 66·5, 66·5, 67, 67, 68.

Kangean: 64, 65, 66, 66, 66, 67, 67, 69, 69.

Bali: 67, 67·8, 68.

Die Vögel von Palawan, woher sich jetzt eine schöne Serie im Tring-Museum befindet, scheinen mir weder zu *A. m. chlorigaster* zu gehören, wohin sie Hartert in *Nov. Zool.* vol. ix p. 209 stellt, noch zu *A. m. malacensis*, wie McGregor im *Manual of the Philippine Birds*, p. 659, annimmt. Die ♂♂ von dort sind unterseits entschieden gelblicher, weniger grünlich als *chlorigaster* und *wiglesworthi*, doch nicht so lebhaft gelb wie *malacensis*; die Färbung der Ohrdecken ist in der Regel grünlich wie bei *malacensis* und *chlorigaster*, nicht rötlich wie bei *rhodolaema* und *wiglesworthi*. Von *wiglesworthi* unterscheiden sie ferner die grünlich olivfarbenen, nicht rötlich olivbraunen Aussensäume der Schwingen, die auch grünlicher, weniger bräunlich sind als bei *chlorigaster*.

Die ♀♀ von Palawan sind unterseits gelblicher als die von *chlorigaster* und *wiglesworthi* und haben grünliche, nicht bräunlich olivfarbene Aussensäume an den Schwingen.

Ein ♂ von Cagayan Sulu (Guillemard coll. 3. iv. 1883, im Tring-Museum) stimmt völlig mit den Palawanvögeln überein; letztere dürften daher zur Form

#### ***Anthreptes malacensis cagayanensis* Mearns**

zu rechnen sein, deren Diagnose ich ganz bestätigt finde bis auf die Angabe, dass die Kopfseiten rötlicher sein sollen als bei *wiglesworthi*, was wohl auf einen Schreibfehler zurückzuführen ist. 3 Exemplare von Sibutu (1 ♂, 2 ♀♀) stimmen gleichfalls mit der Palawanserie, nicht mit *wiglesworthi*, überein.

Flügelänge in mm. (♂♂ ad.):

Palawan: 65, 66, 66, 66, 66, 66, 66·5, 69·5, 67, 67, 67, 67, 67·5, 67·5, 67·5, 68, 70.

Cagayan Sulu: 69.

Sibutu: 69.

#### **125. *Stigmatops indistincta limbata* (S. Müll.).**

*Ptilotis limbata*, *Cat. B.* vol. ix p. 237—*Nov. Zool.* vol. xix p. 344.

♀, Gunung Bratan, 4000 f., 21. i.; 2 ♂♂, G. Bratan, 4000 f., 30. i.; ♂, Gunung Batur, 3500 f., 27. ii.

Iris hellgrau, innere Zone hellbraun; Füße blaugrau oder schiefergrau; Schnabel schwarz.

Dieser Meliphagide scheint auf Bali an die höheren Gebirgsregionen gebunden zu sein. Im Gebirgswald am G. Bratan oberhalb 4000 f. war er nicht selten, und auf den mit niederem Buschwerk bestandenen Plateaus und Hängen des Ostgebirges oberhalb 3000 f. stellenweise recht häufig. Hier besuchte er mit Vorliebe die Blüten eines Rubus-ähnlichen Strauches. Ein sehr zänkischer Vogel, wie die meisten Vertreter der Familie; sein Gesang, den er häufig hören lässt, ist sehr laut und drosselartig.

*Verbreitung*: Bali, Lombok, Sumbawa, Flores, Alor, Sumba, Savu, Timor.—Die Form scheint nach Westen zu an Grösse zuzunehmen:

Flügelänge in mm.:

Bali:	♂ 73, 73, 74.	♀ 65.
Lombok:	♂ 72·5, 75, 76, 76.	♀ 66, 68·5.
Sumbawa:	♂ 71·5, 72, 72·5, 73, 73, 73, 73·5, 74·5, 76.	♀ 62, 64, 65.
Alor:	♂ 73.	♀ 64.
Sumba:	♂ 70, 70, 72, 72, 72.	♀ 62.
Savu:	♂ 68, 70.	♀ 62, 64.

### 126. *Mirafrja javanica javanica* Horsf.

*Mirafrja javanica*, Hartert, p. 546.

2 Ex., Bubunan, 31. iii.; ♂, Buleleng, 3. iv.

Iris braun, Füsse grünlich fleischfarben, Oberschnabel braunschwarz, Unterschnabel gelblich fleischfarben.—Mit Javastücken gut übereinstimmend, und besonders auf der Unterseite brünlicher als *M. j. parva*.

Häufig auf brachliegenden Reisfeldern, hier zuweilen scharenweis vereinigt.

*Verbreitung*: Java, Bali, Borneo (?).

### \*127. *Motacilla boarula melanope* Pall.

♂, Gitgit, 2000 f., 18. ii.

Ich beobachtete ausser diesem Stück noch zwei weitere, an einem Waldbach am Fusse des G. Batur in 3500 f. Höhe, Ende Februar. Die Art scheint in ihren Winterquartieren mit Vorliebe Gebirgsgegenden aufzusuchen; auch in den Molukken fand ich sie stets einzeln oder paarweis an rasch fliessenden Bergbächen.

*Wintergast*.

### 128. *Motacilla flava* L. subsp.

*Motacilla flava*, Hartert, p. 546.

2 juv., 10. und 11. ii.; ♂ ♀, 10. iv.—alle von Buleleng.

Die beiden in Betracht kommenden Formen *M. f. taiwanus* Swinh. und *simillima* Hart. (cf. Hartert, *Vög. pal. Fauna* p. 288) scheinen sich im Winterkleid nicht mit Sicherheit unterscheiden zu lassen. Die am 10. iv. erlegten Exemplare, alte Vögel im letzten Stadium der Kleingefiedermauser, weichen in der Färbung des Oberkopfes von einander ab: bei dem ♂ ist derselbe dunkel oliv, beim ♀ dunkel aschgrau mit schmalen olivgrünen Federsäumen; der Superciliarstreif ist bei beiden weiss. Flügel: ♂ 78, ♀ 73 mm.—Die beiden im Februar gesammelten Jungvögel tragen ein sehr stark abgenutztes Gefieder und mausern noch nicht. Flügel 79 und 82 mm.

Während der vier Beobachtungsmomente in grossen Scharen auf unbestellten Reisfeldern der Küstenregion.

*Wintergast*.

**\*129. *Anthus richardi albidus* Stres.**

*Nov. Zool.* vol. xix p. 316.

♂ ♀, Kintamani, 4000 f., 25. ii.

Iris dunkelbraun, Füsse ockergelb, Oberschnabel schwarzbraun, Unterschnabel ockergelb mit schwarzer Spitze.

Sehr häufig auf den mit kurzem Gras bestandenen Berghängen bei Kintamani, wo man die Vögel meist paarweis sieht. Die Art erinnert in ihrem Wesen und in ihrer Stimme weit mehr an eine Lerche als an einen unserer mitteleuropäischen Pieper.

*Verbreitung*: Bali, Lombok, Sumbawa, Flores, Sumba.

**\*130. *Passer montanus malaccensis* Dubois.**

♀, Buleleng, 9. ii.

In *Not. Leyd. Mus.* vol xxxii p. 165 vereinigt van Oort alle ostasiatischen Feldsperlinge und diejenigen vom malayischen Archipel unter dem Namen *P. m. saturatus* Stejn. Unter dem mir vorliegenden Material erscheinen indessen die indischen und malayischen Stücke entschieden rötlicher, besonders am Bürzel, als solche von Japan und den Liu-Kiu-Inseln, und ich halte daher die von Hartert in *Vög. pal. Faun.* p. 161 angenommene Abtrennung der ersteren für durchaus begründet.

Den Sperling trifft man auf Bali in allen grösseren Ortschaften der Nord- wie der Süd-küste; sein Nest legt er unter Hausdächern an. Balinesisch: petinga.

*Verbreitung*: Vorderindien bis zum Himalaya, Ceylon, Burma, Tenasserim, Malakka, Sumatra, Java, Bali, Makassar, Ambon (in letztgenannter Stadt fand ich ihn häufig). Die Philippinstücke gehören vielleicht zu *P. m. saturatus*.

**\*131. *Amandava amandava* (L.).**

♂, Kutadalem, 4500 f., 2. iii.; ♂ ♀, Kutadalem, 10. iii.

Iris rot, Füsse gelbbraun, Schnabel rot.

Grosse Schwärme dieses prächtig gefärbten Vögelchens traf ich auf dem mit kurzem Gras bestandenen Kamm des Ostgebirges; sonst habe ich es niemals auf der Insel beobachtet.

*Verbreitung*: Vorder-Indien, Assam, Cochinchina, Siam, Hainan; Java, Bali. Ich vermag keinerlei konstante Unterschiede zwischen geographisch weit getrennten Stücken zu entdecken.

Zu *Amandava* Blyth 1836 für *Sporaeiginthus* Cab. 1850 cf. Richmond, *Proc. U. St. Nat. Mus.* vol. xxxv p. 588.

**132. *Munia leucogastra leucogastroides* Horsf. & Moore.**

*Uroloncha leucogastroides*, Hartert, p. 546.

♂, Gitgit, 2000 f., 13. ii.; ♂ ♀, Buleleng, 26. iii.; ♀, Buleleng, 4. iv.

Iris dunkelbraun, Füsse schwarzgrau, Oberschnabel dunkelgrau, Unterschnabel hellgrau.

Gemein in der Kulturregion, bis 4000 f. aufsteigend. Belegte Nester fand ich bei Tjelukan Bawang am 27. und 29. März, je 3 und 5 Eier enthaltend. Sie waren in den Kronen mittelhoher, freistehender Bäume angelegt; das eine von ihnen ist relativ sehr schwer, ein grosser dichtgefügtter Haufen aus reifen Reisähren und

wollhaarigen Gräsern, in den ein kleines Einflugsloch schräg hinabführt; das andere ist sehr lose aus Grashalmen und breiten Bambusblättern gefertigt; sein Einflugsloch befindet sich gleichfalls etwas seitlich. Dimensionen: Höhe 200, Breite 180, resp.: Höhe 230, Breite 100 mm.

2 Eier messen:  $14.7 \times 11.0$  und  $14.6 \times 11.0$  mm.

*Verbreitung*: Java, Bali, Lombok.—Auf Sumatra, Borneo und Malakka durch *M. l. leucogastra* vertreten.

### 133. *Munia punctulata nisoria* (Temm.).

*Cat. B.* vol. xiii p. 353; *Nov. Zool.* vol. xix p. 317.

♂, Gunung Batur, 3500 f., 27. ii.; ♂, Den Pasar, 17. iii.; ♀, Buleleng, 2. iv.

Iris braun oder rotbraun, Füße hellgrau oder dunkel aschgrau, Oberschnabel schwarzgrau, Unterschnabel hellgrau.

Häufig in der Kulturzone; einen sehr grossen Schwarm traf ich zu meiner Überraschung im Kasuarinenwald am Gunung Batur. Am 2. April fand ich in der dichten Krone eines mittelhohen Alleebaumes bei Buleleng ein Nest: es ist ein ziemlich locker gefügter, umfangreicher Grashaufen mit unordentlicher, nicht sehr tiefer, oben offener Mulde und enthielt 6 reinweisse Eier.

Dimensionen in mm.:  $15.8 \times 10.8$ ;  $15.7 \times 10.7$ ;  $15.2 \times 10.7$ ;  $16.7 \times 11.2$ ;  $16.0 \times 11.2$ .

*Verbreitung*: Malakka, Sumatra, Java, Bali, Lombok.

### 134. *Munia maja* (L.).

Hartert, p. 546.

♂, Kuta dalem, 4500 f., 10. iii.

Mehrere Exemplare auf den Grashängen des Ostgebirges unter Schwärmen von *Amandava amandava* gesehen. Balinesisch: bondol.

*Verbreitung*: Malakka, Sumatra, Java, Bali.

### \*135. *Munia ferruginosa* (Sparrm.).

♂ ♀, Buleleng, 4. iv.

Iris dunkelbraun, Füße blaugrau, Schnabel hellgrau.

Anscheinend nicht selten in den Reisfeldern.

*Verbreitung*: Java, Bali.

### 136. *Munia oryzivora* (L.).

Hartert, p. 546.

♂, Buleleng, 11. ii.

Iris braunrot, Füße blassrosa, Schnabel blassrot, Spitze des Oberschnabels hellviolett.

Sehr gemein in der Kulturregion bis etwa 2000 f., oft in Schwärmen von mehreren Hunderten beisammen. Auch im parkartigen lichten Urwald der Küstenregion West-Balis häufig. Der Reisfink brütet in Buleleng in Häusern; das Nest wird nach Spatzenart auf Balken unter dem Dach angelegt und besteht in einem liederlichen Henhaufen. Eines von ihnen enthielt am 3. April zwei Eier; sie sind reinweiss und messen:  $18.5 \times 13.1$ ;  $18.5 \times 13.3$  mm.

Spontane *Verbreitung*: Lombok, Bali, Java, Sumatra, Borneo, Philippinen, Malakka, Tenasserim (?).



137. *Ploceus manyar manyar* (Horsf.).

*Ploceus manyar*, Hartert, p. 546.

*Nor. Zool.* vol. xix p. 319.

2 ♀ ♀, 1 ♂, Tjelukan Bawang, 25. iii.; ♂, Tjelukan Bawang, 26. iii.; ♀, Buleleng, 2. iv.; 2 ♂ ♂, Buleleng, 3. iv.

Iris braun, Füsse blass fleischfarben oder bräunlich fleischfarben; Oberschnabel bräunlich schwarz (♂) oder dunkelbraun (♀), Unterschnabel heller.

Häufig an der Nordküste in feuchten Gegenden mit grossen Grasflächen und niederem Buschwerk. In der Zeit zwischen dem 26. iii. und 5. iv. sammelte ich 8 belegte Nester, welche 3–5 Eier enthielten. In einem weiteren Nest befanden sich am 26. iii. bereits flügge Junge.

Auf die Nester passt die ausführliche Beschreibung vollkommen, welche Bernstein in *J. f. O.* 1861 p. 177 von denjenigen des *Ploceus philippinus atrigula* (sub nom. *Ploceus baya*) gegeben hat, nicht aber die von denen seines "*Ploceus hypoxanthus*," der mit *Ploceella javanensis* und nicht mit *Ploceus manyar* ident ist. Eine erneute Beschreibung erübrigt sich; das Längenmass (vom Auheftungspunkt bis zum Nestboden) schwankt zwischen 250 und 140, die Nestbreite (ohne Gang) zwischen 100 und 110 mm.

Die Nester werden gewöhnlich kolonieweis angelegt, mit Vorliebe in Phragmitis (?)-Beständen, wie sie an nassen Stellen grosser Rodungen im Küstenbezirk häufig sind. In die Spitzen der etwa 3 m. hoch aufragenden Halme wird das Nest dergestalt verwoben, dass es von mehreren gleichzeitig getragen wird. Zuweilen findet man es auch an den Zweigen eines Busches hängend.

Masse der Eier (in mm.) :

(a) 21.2 × 14.6; 26.2 × 14.0.

(b) 22.3 × 15.0 (von irregulärer Gestalt).

(c) 21.3 × 14.7.

(d) 21.4 × 15.1; 22.5 × 15.2; 20.6 × 15.3.

(e) 20.4 × 14.2.

(f) 22.0 × 14.4; 23.0 × 15.3; 21.1 × 14.7; 22.7 × 15.1; 21.8 × 14.8.

(g) 21.6 × 15.0; 21.1 × 14.5; 21.5 × 15.1; 20.7 × 15.2; 20.2 × 13.6.

(h) 21.0 × 14.7.

Die Eier sind reinweiss, ohne Flecken, und nahezu glanzlos (vergl. Humedates, *Nests and Eggs Ind. Birds* ii p. 124).

Verbreitung : Java, Bali.

[138. *Dicrurus hottentottus bimaënsis* Wall.]

*Chibia bimaënsis*, Hartert, p. 547.

Verbreitung : Bali, Lombok, Sumbawa, Flores, Pantar, Alor, Sumba.

Die Formen, die Sharpe im *Cat. B.* unter dem Genusnamen *Chibia* vereinigt, stehen einander alle sehr nahe, sind durch Zwischenglieder mehr oder weniger eng verknüpft und vertreten sich geographisch. Sie bilden eine "Realgattung" im Sinne Kleinschmidts, die von Indien bis nach Australien verbreitet ist.

139. *Dicrurus cineraceus cineraceus* (Horsf.)

*Dicrurus cineraceus*, Hartert, p. 547.

♂, Pik von Buleleng, 3000 f., 15. i.; 2 ♂ ♂, Danau Bratan, 2500 f., 17. i.; ♀, Danau Bratan, 2500 f., 18. i.

Iris braunrot oder hell rotbraun, Schnabel und Füsse schwarz. Flügel: 124 (juv.), 129, 129, 129 mm.

Gemein im Gebirgswald zwischen 2500 und 5000 f.; seltener im Urwald der Tiefebene.

*Verbreitung*: Java, Bali.—Vergl. Hartert, *Nov. Zool.* vol. iii p. 560 und vol. xvii p. 249.

#### 140. *Dicrurus ater longus* Bp.

*Dicrurus longus* (?), Hartert, p. 547.

♀, 11. ii.; ♀, iii.; ♀, 6. iv.—alle von Buleleng.

Iris dunkelbraun, Schnabel und Füsse schwarz.

Diese Form stimmt in den Flügelmassen mit *D. a. minor* Blyth, von Ceylon, überein, unterscheidet sich jedoch durch die bedeutendere Länge des Schwanzes, insbesondere der äusseren Steuerfedern.

Bali:	♀, Flügel	134	Äussere Steuerfedern	151 mm.
„	♀, „	133	„	148 „
Java:	♂, „	128	„	159 „
Ceylon:	♀, „	134	„	142 „
„	♂, „	130	„	140 „
„	ad., „	125	„	133 „

Nicht selten in den Reisfeldern, wo die Vögel nach Würgerart auf einzelstehenden Pfählen zu ruhen pflegen, oder auf Viehweiden, wo ich sie öfters auf dem Rücken grasender Wasserbüffel sitzen sah. Seltener im Urwald, hier bis 4000 f. aufsteigend. Balinesisch: pedjä-pedjä.

*Verbreitung*: Java, Bali.

#### 141. *Oriolus maculatus maculatus* Vieill.

*Oriolus maculatus*, *Cat. B.* vol. iii p. 200; Hartert, p. 547.

♂, Buleleng, 9. iii.

Iris rotbraun, Füsse hellgrau, Schnabel blassrosa.

Sehr häufig in den Pflanzungen und am Rande des Urwaldes, bis etwa 3500 f. aufsteigend. Der Pfiff ähnelt dem von *Oriolus oriolus*.

*Verbreitung*: Sumatra, Banka, Borneo, Java, Bali; Malakka?

Flügelänge in mm.:

Bali: 142, 143·5.

Java: 135, 136, 139, 141, 143.

Sumatra: 130, 138, 139, 146.

Sioban (Mentawai-Arch.): 148.

#### 142. *Gracupica tertia* Hart.

Hartert, p. 547.

Abbildung: *Nov. Zool.* vol. xix t. ii.

♂, Buleleng, 12. i.; ♀, Gitgit, 15. i.; 1 Ex., Buleleng, 27. iii.

Iris braun, Füsse hellgelb, Schnabel gelb, nackte Augengegend goldgelb.

Gemein in der Kulturarzone, besonders auf unbestellten Reisfeldern sich einstellend, bei Kintamani bis 4000 f. aufsteigend. Balinesisch: tjurek.

Van Oort ist im Irrtum, wenn er—ohne den Typus gesehen zu haben—in *Not. Leyd. Mus.* vol. 32 p. 158 die Meinung ausspricht, die Art sei auf ein junges

Stück von *Gracupica melanoptera* gegründet. Er hat offenbar Harterts Notiz in *Nov. Zool.* vol. iii p. 594 übersehen, in der eine ganze Serie dieser Art von Lombok registriert ist, die alle mit dem Typus übereinstimmen.

*Verbreitung* : Bali, Lombok.

\*143. **Leucopsar rothschildi** Stres.

*Leucopsar rothschildi* Stresemann, *Bull. B. O. Club* vol. xxxi p. 4 (1912—Bali).

*Abbildung* : *Nov. Zool.* vol. xix t. ii. (Gefiederton etwas zu grau!).

♀, Bubunan, 24. iii.

Dieser schöne, sehr auffallend gefärbte Star scheint sehr selten zu sein. Ausser dem geschlossenen Vogel, der sich im Wipfel einer Kokospalme nahe bei einer an der Nordküste gelegenen Ortschaft aufhielt, sah ich mit Sicherheit nur noch ein Exemplar eine Woche darauf an ganz der gleichen Localität, hatte aber zufällig keine Patrone mehr bei mir.

*Verbreitung* : Bali.

144. **Sturnopastor contra jalla** (Horsf.).

*Sturnopastor jalla*, *Cat. B.* vol. xiii p. 57.

♀, Buleleng, 11. ii. ; ♀, Rendang, 13. iii. ; ♀, Buleleng, 5. iv.

Iris gelblich weiss, Füsse hell lehmgelb, Schnabel hellgelb.

Häufig in der Region der Reisfelder, bis etwa 2000 f. aufsteigend.

*Verbreitung* : Sumatra, Java, Madura, Bali.

145. **Aplonis panayensis gusti** subsp. n.

*Calornis chalybea*, Hartert, p. 546.

♀, Gitgit, 2000 f., 2. ii. ; ♀, Rendang, 1500 f., 13. iii. ; 2 ♂♂, Danau Bratan, 3000 f., 21. iii.

Iris rot, Schabel und Füsse schwarz.

Diese Form ist von allen übrigen durch den starken bläulichen Glanz, besonders auf der Unterseite, unterschieden : in gewissem Lichte erscheint die letztere dunkel violettblau. Schnabel kürzer und niedriger als bei *A. p. strigatus* ; Federn von Stirn und Scheitel nicht lang und fein zugespitzt, sondern mit kurzer stumpfer Spitze. Auf einige Merkmale der neuen Form hatte bereits Hartert aufmerksam gemacht.

*Typus* : ♂, Danau Bratan, 3000 f., 21. iii. 1911, E. Stresemann coll. No. 328.

Die Art ist besonders in den Kaffeepflanzungen am Gebirgshang häufig und tritt hier oft in grossen Scharen auf, bis 3500 f. aufsteigend. Sie findet sich auch in der Nähe der Ortschaften und nistet in Buleleng unter Hausdächern. Der Gesang gleicht demjenigen der Malakkaform, wie ich ihn in Perak vernommen habe.

*Verbreitung* : Bali.

Über die geographischen Formen dieser Art vergl. die ausgezeichnete Übersicht bei Meyer und Wigglesworth, *Birds of Celebes*, vol. ii pp. 554–60. Genaue Massangaben finden sich ferner bei Parrot, *Beitr. Orn. Sum.* pp. 255–6, im folgenden als P citiert.

Ich gelange nach eingehendem Vergleich der Serien im Tring-Museum zu dem

gleichen Ergebnis wie Meyer und Wilesworth, welche die unter dem Namen *neglecta* durch Walden abgetrennten Celebesvögel im Gegensatz zu Sharpe mit der Philippinenform vereinigen. Ein Unterschied in der Schwanzlänge, den Sharpe angibt, besteht nicht, auch stimmen Färbung, Schnabelform und Flügellänge bei beiden überein. Letztere beträgt in mm. bei einer Serie von den

Philippinen : 95, 96, 96, 99, 100, 100, 100, 101, 101, 101, 102, 102, 102, 102, 102, 103, 104, 105, 105, 105, 109, 110, 111, 111.

von Celebes : 98, 100, 101, 102, 104, 104, 107, 108, 108, 108, 110, 110.

*A. p. sanghirensis* (Salvad.) ist durch bedeutendere Durchschnittsgrösse und relativ längeren Schnabel gut unterschieden.

Typische *A. p. strigatus* von Java und Sumatra sind von stärkerem Glanz als Philippinenstücke (*A. p. panayensis*) und unterseits ausgesprochener grün, mit geringerem violettrotlichem Schimmer, auch ist die Grösse aller Teile geringer. Diese Form geht nun in Malakka und Tenasserim allmählich in den nördlichen *A. p. affinis* (Hay) über, der seine extremste Ausbildung in Ostbengalen, Cachar und Oberburma erfährt und sich von *strigatus* durch bedeutendere Grösse und oft etwas stärker rotvioletten Schimmer der Unterseite unterscheidet, von *panayensis* durch abweichende Schnabelform und grünlichere Oberseite, sowie stärkeren Glanz des Gefieders. Vögel von Nordwest-Borneo, Sirhassen und dem Natuna-Archipel vermitteln den Übergang zwischen Malakka- und Philippinenvögeln.

Flügellänge in mm. :

*Aplonis panayensis gusti.*

Bali : 93, 94, 94, 97, 97·5, 98, 98.

*Aplonis panayensis strigatus.*

Java : 89, 90, 90, 91, 92, 94, 95, 95, 96, 96, 97.

Sumatra : 90 [P], 92 [P], 93 [P], 95 [P], 96 [P], 96, 96, 97 [P].

Bangka : 93 [P], 94 [P].

Durchschnitt von 21 Exemplaren : 94·0 mm.

*Aplonis panayensis strigatus > affinis.*

Malakka : 94, 94\*, 94\*, 95\*, 95\*, 95\*, 96, 96, 96\*, 96·5\*, 97, 98\*, 98\*, 98\*, 98\*, 99\*, 99\*, 99\*, 99, 100\*, 100·5\*, 101, 104, 104.—Durchschnitt von 23 Ex. : 97·9 mm.

Salanga : 94\*, 98\*, 99·5\*, 100\*, 100·5\*, 102\*, 102·5\*.

*Aplonis panayensis strigatus < affinis.*

Tenasserim : 96\*, 96\*, 97\*, 98·5\*, 100\*, 100\*, 101\*, 101·5\*, 102\*, 102\*, 102\*, 102\*, 103\*, 103\*, 103\*, 103\*, 103·5\*, 104\*, 104·5\*, 106\*.—Durchschnitt von 20 Ex. : 101·4 mm.

*Aplonis panayensis affinis.*

Cachar : 103, 107\*, 107, 109\*.

Tipparah : 104\*, 105\*, 105\*, 106\*, 108\*.—Durchschnitt von 9 Ex. : 105·9 mm.

*Aplonis panayensis strigatus > affinis*  $\cong$  *panayensis.*

N.W. Borneo : 99, 103.

Sirhassen : 104, 104·5, 106.

Bunguran : 104.

Pulu Laut (nördl. v. Bunguran) : 105.

Die Barussan-Inseln, wie Oberholser die Kette der vor der Westküste Sumatras gelegenen Inseln mit einem Kollektivnamen zu bezeichnen vorgeschlagen hat, scheinen eine Anzahl wohl unterschiedener Formen zu beherbergen, von welchen *A. p. altirostris* Salvad. die weiteste Verbreitung besitzen dürfte: Nias, Batu- und Tello-Inseln, sowie die nördlichen Mentawai-Inseln.

Flügelänge in mm.:

Nias: 100.

Batu-Inseln: 96, 104, 106, 106.

Tello-Inseln: 105.

Si-Oban: 98, 106.

Von dieser Form wurden durch Oberholser neuerdings (in *Smiths. Misc. Coll.* vol. 60, No. 7, p. 17) die Vögel von Süd-Pagi unter dem Namen *pachistorhinus* unterschieden, mit der kurzen Diagnose: "Similar to *Lamprocorax chalybeus altirostris* from Nias Island, but with wing longer, and plumage somewhat less glossy." Der gleiche Autor stellte *l. c.* eine Form *rhadinorhamphus* auf, "resembling *L. ch. pachistorhinus*, but bill more slender, size smaller, plumage somewhat less glossy, particularly below.—Type Simalur-Island." Auf Engano schliesslich wird die Art repräsentiert durch *A. p. enganensis* (Salvad.): "*Calornis c. chalybeae* (Horsf.) similis, sed maior, alis longioribus (115 mm.), rostro robustiore."

Eine im Tring-Museum befindliche Serie von Pini, nordöstlich der Batu-Inseln, erweist sich als keiner der bisher von den Barussan-Inseln bekannten Subspecies zugehörig; die Pinivögel stehen dem *A. p. tytlerei* überaus nahe, unterscheiden sich aber durch kürzeren Schwanz und die Form des—gleichfalls sehr schlanken—Schnabels: die Krümmung der Oberschnabelfirste ist weniger gleichmässig als bei *tytlerei*, vielmehr beginnt sie erst im apicalen Drittel. Ich benenne die neue Form

***Aplonis panayensis leptorrhynchus* subsp. n.**

*Typus*: Pini, Raap coll. No. 34, im Tring-Museum.

Zum Vergleich beider Unterarten seien die vom Material des Tring-Museums genommenen Flügel- und Schwanzmasse beigefügt.

*Aplonis panayensis tytlerei.*

Car Nicobar: *a* 116, *c* 76.

Trinkut: *a* 116, *c* 75.

Süd-Andaman: *a* 113, 116, 117; *c* 69, 75, 78.

*Aplonis panayensis leptorrhynchus.*

Pini: *a* 111, 114, 114, 116, 116; *c* 66, 67, 70, 70, 71.

Eine generische Trennung der Arten mit gestuftem (*Lamprocorax*) von denen mit ungestuftem Schwanz (*Aplonis*) ist durchaus künstlich, da zwischen beiden Typen zahlreiche Übergänge vermitteln. Vergl. auch Sharpe, *Cat. B.* vol. xiii p. 125 Anm.

**146. *Gracula javana javana* (Cuv.).**

*Eulabes javanensis typicus*, Hartert, p. 547.

*Nov. Zool.* vol. xix p. 313.

♂, Tegal, 1500 f., 3. iii.; ♂, Kembangsari, 2000 f., 3. iii.

Häufig in der Region der Kaffeepflanzungen zwischen 1500 und 3000 f., seltener in der Küstenebene.

*Verbreitung*: Bali, Kangean, Java, Sumatra, Billiton, Banka, Borneo, Natuna, Malakka, Süd-Tenasserim.

In *Revue Française d'Ornithologie* 1912 p. 364 führt Dr. Dubois "*Gracula javanensis* var. *dubia* Schl." mit einem ? von Bali auf. Was den Autor dazu bestimmt hat, als Heimat dieses Vogels, der ganz offenbar als junges Exemplar von *Gracula javana* gedeutet werden muss, die Insel Bali zu vermuten, entzieht sich meiner Kenntnis.

[147. *Corvus coronoides macrorhynchos* Wagl.]

*Corone macrorhyncha*, *Cat. B.* vol. iii p. 38.

Die Art ist auf Bali in der Kulturzone allenthalben häufig und stellt sich zuweilen, besonders in Süd-Bali, massenhaft auf frisch gepflügten Reisfeldern ein, dem Menschen gegenüber äusserst zutranlich.

*Verbreitung*: Inselkette von Java bis Timor; Sumatra (?), Borneo (?), Malakka (?).

\*148. *Corvus enca enca* (Horsf.).

♂, Buleleng, 13. i.

*Verbreitung*: Java, Bali, Celebes, Sula-Inseln.

[149. *Crypsirhina varians* (Lath.).]

Hartert, p. 547.

*Verbreitung*: Cochinchina, Siam, Burma, Malakka, Borneo, Sumatra, Java, Bali.

## ZOOGEOGRAPHISCHE SCHLUSSFOLGERUNGEN.

Ogleich unsere Kenntnis der Ornis Balis noch längst nicht als abgeschlossen betrachtet werden darf, und diejenige der Vogelwelt von Lombok und Sumbawa vermutlich noch grössere Lücken aufweist, dürfte eine Zusammenfassung unseres heutigen Wissens hinsichtlich der Ornithogeographie dieser Inselgruppen doch am Platze sein, und die Resultate, zu denen wir gegenwärtig gelangen, dürften bei der Fülle des Materials nicht weit vom tatsächlichen Sachverhalt abliegen.

Ich möchte zunächst eine rein terminotechnische Erörterung vorausschicken. Aus Gründen der grösseren Klarheit und Übersichtlichkeit sehe ich mich veranlasst, in den folgenden statistischen Zusammenstellungen eine neue Terminologie einzuführen. Unterschiede ich darin, wie sich dies aus der Benutzung der üblichen Ausdrücke ergeben würde, lediglich zwischen Arten (*species*) und Formen (*subspecies*), so würde hierdurch insofern ein falsches Bild erzielt, als mit der Bezeichnung Art gegenwärtig zwei systematisch verschiedenwertige Begriffe benannt werden. Beispiel: *Oreoosterops javanica* ist zu einem Artbegriff geworden, ist keine ungeteilte "Art" mehr, seitdem wir von dem typischen, der Hauptmasse nach ostjavanischen Vogel den ihm sehr nahestehenden westjavanischen und den balinesischen zu unterscheiden gelernt haben. *Halecyon cyanoventris* ist eine stark specialisierte Art, ausschliesslich den Inseln Java und Bali gemeinsam und auf beiden in der gleichen Ausbildung entwickelt. Zählte ich nun in einer Zusammenstellung *Oreoosterops javanica* und *Halecyon cyanoventris* als **Arten**, die Bali und Java ausschliesslich eigentümlich sind, im Gegensatz zu den ausschliesslich

gemeinsamen geographischen **Formen**, welche Arten von weiterer Verbreitung unterzuordnen sind, so würde dies eine Trübung des Sachbildes hervorrufen und gleichzeitig einen Fehler in den Summierungen ergeben; die ausschliesslich gemeinsame Art und Form *Halcyon cyanoventris* deutet auf eine nahe Zusammengehörigkeit von Java und Bali hin, die ausschliesslich gemeinsame Art *Oreosterops javanica* verbindet beide und betont doch gleichzeitig den faunistischen Unterschied, da sie auf Java in etwas anderer Form ausgebildet ist als auf Bali.

Ich werde daher in Zukunft den **Artbegriff** kurz als **Art** bezeichnen, die **ungebrochene Species** als **Altform**, die geographische getrennten **Repräsentanten eines Artbegriffes** als **Jungformen**. Beispiele:

Art: *Oreosterops javanica*.

Altform: *Halcyon cyanoventris*.

Jungformen: *Oreosterops javanica javanica*, *frontalis* und *elongata*.

Der Gedanke, der zur Wahl dieser Ausdrücke führt, ist der folgende: Jede Tierform [Altform] sei—um im Bilde zu sprechen—einem niederen einzelligen Organismus vergleichbar, der, nachdem er ein gewisses Alter erreicht oder sein Volumen um einen gewissen Bestand zugenommen hat, oder aber veranlasst durch Einwirkungen von aussen, sich zur Teilung in zwei oder mehr selbständige Tochtertiere anschickt. Diese Teilung wird mit einer Oberflächenfurchung ihren Anfang nehmen, und die Furchen werden, im Beginn des Processes nur dem geübten Auge erkennbar, allmählich sich tiefer einschnüren und deutlicher ausprägen, ohne dass zunächst eine dieser werdenden Tochterzellen selbständige Bewegungsfreiheit besitzt: sie sind von einer gemeinsamen Membran umschlossen [ternäre Nomenklatur, Unterordnung der Formen unter einen Artbegriff; Jungformen, zusammengehalten durch die Membran "**Art**"]. Erst nachdem die Furchen völlig durchgeschnürt haben, zerreisst die umhüllende Membran und die Tochterzellen erhalten damit Individualität und die Möglichkeit eigenwilliger Bewegung; oder, um das Bild zu verlassen und zur Sache zurückzukehren: Die Jungformen reifen zu Altformen, die sich durch verschiedensinnige Specialisierung morphologisch immer weiter von einander entfernen und hierauf häufig geographisch ineinanderschieben, ohne eine artliche Vermischung einzugehen. Hierbei wird gleichzeitig die Tochter-Altform, die sich vom Entstehungszentrum der Mutter-Altform am wenigsten weit entfernt hat, den Typus der letzteren am reinsten bewahren, soweit sich dortselbst keine Veränderungen der physiologischen Bedingungen vollzogen haben.

Soll sich nach gewissen Zeiträumen bei der Tochter-Altform der gleiche Reife- und Teilungsprocess abspielen wie bei der Mutter-Altform, so erscheinen hierfür die folgenden Bedingungen erforderlich: Ausdehnung oder Verlagerung des Verbreitungsgebietes; oder orographische Veränderungen inmitten des letzteren, von der Bedeutung einer für die Art unüberwindlichen Scheide.—Altformen, deren Area auf ein relativ kleines und klimatisch gleichförmiges Gebiet, etwa eine kleinere Insel, beschränkt bleibt, werden zwar in der Weiterentwicklung morphologischer Eigenarten nicht stehen bleiben, aber niemals zur Teilung schreiten können. Es erübrigt sich wohl, zu bemerken, dass diese Ausführungen nur für die Erklärung **ornithogeographischer** Phänomene Gültigkeit beanspruchen, insbesondere solcher in Inselgebieten.

Nur soweit sei für heute dieser Gedanke verfolgt. Der oben geführte Vergleich einer in Teilung begriffenen Altform mit der sich furchenden Zelle erweist sich in einem Punkte als schief: der Irrealität der die Jungformen umschliessenden

“Art-Membran.” Die Entscheidung, ob bei Formen “entre deux âges” eine binäre oder ternäre Benennung Verwandtschaft und Alter am klarsten zum Ausdruck bringt, wird daher stets dem Gutdünken des Einzelnen überlassen bleiben. Und dies ist gleichzeitig ein Punkt, der die zoogeographischen Schlussfolgerungen nicht unwesentlich berührt.

Bevor ich auf diese eingehe, seien einige kurze topographische Informationen vorausgeschickt. Die Fläche der Inseln Java, Bali, Lombok und Sumbawa, deren Ornis im folgenden berücksichtigt werden soll, verhält sich etwa wie 23 : 1 : 1 : 2,5. Alle vier Inseln sind im wesentlichen vulkanischen Ursprungs, und aus tieferen Lagen sind von ihnen jungtertiäre Meeres-Ablagerungen bekannt: Bedeutende Niveauschwankungen und Reliefveränderungen bis in die geologisch jüngste Vergangenheit sind daher wahrscheinlich. Die Vegetationsverhältnisse sind von Java bis Sumbawa ähnliche: in den niederen Lagen viel offenes, fruchtbares Kulturland, daneben, zumal im Mittelgebirge, ausgedehnte Urwälder, an den hohen Aschenkegeln spärliche Busch-, Gras- oder Kasuariumvegetation.

Die heutige Minimalbreite der die Inseln trennenden Meeresstrassen beträgt beiläufig in Seemeilen:

Sundastrasse (Sumatra-Java): 13.

Balistrasse (Java-Bali): 15.

Lombokstrasse (Bali-Lombok): 19.

Alasstrasse (Lombok-Sumbawa): 75.

Ferner beträgt nach den gegenwärtigen Lotungen die Maximal- und Minimaltiefe dieser Strassen, ausgedrückt in Faden (1 Faden = 1,8 m.).

Sundastrasse: 65—30; Balistrasse: 84—25; Lombokstrasse: 634—122; Alasstrasse: 79—48.

Wenn wir daher im folgenden die **Lombokstrasse**—in völliger Bestätigung der Wallaceschen Vermutung—als **wichtige Faunengrenze** kennen lernen, so steht dies ganz in Übereinstimmung mit dem, was sich aus den heutigen Lagebeziehungen der Inseln erwarten lässt. Sie wird **überschritten** von mehr als **60** sedentären **Arten** (nicht mitgerechnet sind die meist sehr weit verbreiteten Ardeiden), unter welchen wir bei 10 zwischen Bali und Lombok (oder, falls die Art auf Bali resp. Lombok nicht vertreten ist, zwischen Lombok und Java oder Bali und Sumbawa) eine zu zwei Formen führende “Einschnürung” (sit venia verbo!) antreffen. Dagegen bildet hier die “**Wallace-sche Linie**” die **Westgrenze** für **20**, die **Ostgrenze** für **62 Arten** und Altformen! Im einzelnen ergibt sich, dass ihre **Westgrenze** finden in

Sumbawa: Altformen + Arten: (7 + 4) 11, Jungformen 4

Lombok: „ + „ (8 + 12) 20 „ 7

Bali: „ + „ (2 + 4) 6 „ 12 (13?)

ihre **Ostgrenze** dagegen in

Bali: Altformen + Arten: (27 + 35) 62, Jungformen 8

Lombok: „ + „ (3 + 12) 15 „ 6

Sumbawa: „ + „ (0 + 1) 1 „ 5

Die Familie der Capitoniden, auf Bali noch in vier Arten vertreten, überschreitet die Lombokstrasse nicht, diejenige der Piciden, die auf Bali durch 6 Arten repräsentiert ist, geht nur in einer Jungform (*Yungipicus sondaicus grandis*) östlicher. Auf der anderen Seite finden wir, dass die Cacatuiden in einer Art bis Lombok, aber nicht weiter westlich sich verbreitet haben, während die



Loriiden und Meliphagiden ihren westlichsten Ausläufer (*Trichoglossus haematodus mitchelli* und *Stigmatops indistincta limbata*) bis Bali entsandt haben.

Zur Illustrierung der nachbarlichen Beziehungen, welche die Ornis dieser Inseln offenbart, mögen ferner die folgenden Zusammenstellungen dienen. Wir finden

**Endemische Altformen auf:**

- Bali : 1 (*Leucopsar rothschildi*).  
 Lombok : 0.  
 Sumbawa : 0.

**Endemische Jungformen auf:**

- Bali : 6 (7?) [*Oreosterops javanica elongata*; *Criniger gularis baliensis*; *Phoenicophaeus curvirostris deningeri*; *Dinopium javanense exsul*; *Aplonis panayensis gusti*; *Rhinomyias umbratilis baliensis?*; *Carpophaga lacernulata williamsi*.]  
 Lombok : 2 [*Dicaeum mackloti neglectum*; *Dicrurus cineraceus wallacei*.]  
 Sumbawa : 4 [*Lophozosterops dohertyi dohertyi*; *Rhipidura diluta sumbawensis*; *Trichoglossus haematodus forsteni*; *Zosterops (chloris?) sumbawensis*.]

**Ausschliesslich gemeinsam sind:**

**Java und Bali.**

- Altformen : 10 (11?)  
 Arten : 2  
 Jungformen : 18 } siehe Tabelle.

**Bali und Lombok.**

- Altformen : 1 [*Gracupica tertia*].  
 Arten : 0.  
 Jungformen : 1 [*Trichoglossus haematodus mitchelli*].

**Lombok und Sumbawa.**

- Altformen : 0.  
 Arten : 0.  
 Jungformen : 1 [*Geoffroyus personatus sumbawensis*].

**Sumatra, Java, Bali.**

- Altformen : 1 (2?) [*Ptilinopus porphyreus*; *Prinia familiaris?*].  
 Arten : 0.  
 Jungformen : 1 [*Xantholaema rosea rosea*].

**Java, (Bali, Kangean,) Lombok.**

- Altformen : 1 [*Iloreites montana*].  
 Arten : 0.  
 Jungformen : 6 (7?) [*Turdus varius horsfieldi*; *Orthotomus sepium sepium*; *Pericrocotus flammeus exsul*; *Munia leucogastra leucogastroides*; *Collocalia linchi linchi*; *Treron griseicauda griseicauda*; ? *Macropygia ruficeps ruficeps*].

**Bali, Lombok, Sumbawa.**

- Altformen : 0.  
 Arten : 0.  
 Jungformen : 0.

**Sumatra, Java, (Bali,) Lombok.**

Altformen : 0.  
 Arten : 0.  
 Jungformen : 1 [*Sphenocercus sphenurus korthalsi*].

**Java, Bali, Lombok, Sumbawa.**

Altformen : 0.  
 Arten : 0.  
 Jungformen : 1 [*Phylloscopus trivirgatus trivirgatus*].

**Altformen von der Minimalverbreitung Sumatra bis Sumbawa.**

*Gallus ferrugineus*; *Chalcophaps indica*; *Treron vernans*; *Cisticola exilis*; *Geocichla interpres*, etc

**Jungformen von der Minimalverbreitung Sumatra bis Sumbawa.**

*Carpophaga aenea aenea*; *Streptopelia chinensis tigrina*; *Macropygia phasianella emiliana*; *Haliastur indus indus*  $\leq$  *girrenera*; *Caprimulgus macrourus macrourus*; *Caprimulgus affinis affinis*; *Cacomantis sepulchralis sepulchralis*; *Cuculus intermedius insulindae*; *Eudynamis orientalis malayana*; *Lanius schach bentet*; *Dendrobiastes hyperythra malayana*; *Muscicapula melanoleuca westermanni*; *Parus maior cinereus*; *Cinnyris ornata ornata*, etc.

Die zoogeographischen Schlüsse lassen sich demnach kurz dahin zusammenfassen: (1) Unter der Ornis der Inseln Bali, Lombok und Sumbawa besitzt diejenige von Bali die grösste Selbständigkeit. (2) Auf Bali überwiegt die Zahl der westlichen Formen bei weitem die der östlichen, auf Sumbawa besitzen australisch-papuanische Formen das Übergewicht, die Ornis von Lombok ist aus Elementen beider Faunenregionen etwa zu gleichen Teilen zusammengesetzt. (3) Java und Bali dürften längere Zeit einen einheitlichen Complex dargestellt haben, ihre Verbindung jedoch mag schon seit langem \* unterbrochen sein, da sich einige endemische Formen haben entwickeln können, die auf Java durch nahe verwandte vertreten sind. Zwei Formen, die Bali und Ostjava eigentümlich sind (*Pycnonotus bimaculatus tenggerensis* und *Copsychus saularis amoenus*), auf Westjava jedoch durch andere Jungformen repräsentiert sind, scheinen darauf hinzudeuten, dass zur Zeit der Verbindung Balis mit Ostjava dieses durch eine Meeresstrasse von Westjava getrennt war. Die Annahme des Bestehens einer solchen Trennung wird gestützt durch die jungtertiären marinen Ablagerungen in Mitteljava und durch die folgenden weiteren Arten, die in West- und Ostjava in verschiedenen Jungformen ausgebildet sind: *Turdus fumidus fumidus* und *whiteheadi* sowie *Oreosterops javanica frontalis* und *javanica*; letztere ist offenbar erst, nachdem die Trennung beider Teile Javas zu bestehen aufgehört hatte, in geringer Zahl ins Gebiet der ersteren eingewandert. (4) Eine zeitweilige Landbrücke zwischen Bali und Lombok ist wahrscheinlich, vermutlich zu einer Periode, als erstere Insel nicht mit Java, letztere nicht mit Sumbawa in Zusammenhang stand.

In der folgenden Tabelle bezeichnen horizontale Striche das Fehlen einer Art oder Altform, Kreuze das Auftreten einer Altform; das Vorkommen einer Art ist durch Einfügen des Namens der sie vertretenden Jungform in die Kolonne der betreffenden Insel ausgedrückt.

\* Zum wenigsten seit dem jüngeren Pleistocän.

SPECIES.	SUMBAWA.	LOMBOK.	BALI.	JAVA.	SUMATRA.
<i>Leucopsar rothschildi</i>	—	—	+	—	—
<i>Oreosterops javanica</i>	—	—	elongata	O. u. W. javanica W. frontalis	—
<i>Criniger gularis</i>	—	—	baliensis	gularis	gutturialis
<i>Phoenicophaës curvirostris</i>	—	—	deningeri	curvirostris	erythrognathus
<i>Dinopium javanense</i>	—	—	exsul	javanense	javanense
<i>Aplonis panayensis</i>	—	—	gusti	strigatus	strigatus
<i>Rhinomyias umbratilis</i>	—	—	baliensis	?	umbratilis
<i>Pycnonotus bimaculatus</i>	—	—	tenggerensis	O. tenggerensis W. bimaculatus	—
<i>Copsychus saularis</i>	—	—	amoenus	O. amoenus W. musicus	musicus (Borneo ; amoenus)
<i>Halcyon cyanoventris</i>	—	—	+	+	—
<i>Xantholaema australis</i>	—	—	+	+	—
<i>Chrysocolaptes strictus</i>	—	—	+	+	—
<i>Cryptolopha grammiceps</i>	—	—	+	+	—
<i>Graucalus javensis</i>	—	—	+	+	—
<i>Cyanoderma melanothorax</i>	—	—	+	+	—
<i>Myiophonus cyaneus</i>	—	—	+	+	—
<i>Prinia familiaris</i>	—	—	+	+	?
<i>Dicaeum flammeum</i>	—	—	+	+	—
<i>Munia ferruginosa</i>	—	—	+	+	—
<i>Glauclidium castanopternum</i>	—	—	+	+	—
<i>Conurus alexandri</i>	—	—	alexandri	alexandri	(Continent : fasciatus)
<i>Loriculus vernalis</i>	—	—	pusillus	pusillus	(Continent : vernalis)
<i>Lalage fimbriata</i>	—	—	fimbriata	fimbriata	culminata
<i>Aegithina tiphia</i>	—	—	scapularis	scapularis	viridis
<i>Melittophagus leschenaulti</i>	—	—	leschenaulti	leschenaulti	(Continent etc. ; swinhoii)
<i>Hemiprogne longipennis</i>	—	—	longipennis	longipennis	harterti
<i>Surniculus lugubris</i>	—	—	lugubris	lugubris	brachyurus
<i>Cyanops armillaris</i>	—	—	armillaris	armillaris	henrici
<i>Thereceryx lineatus</i>	—	—	lineatus	lineatus	(Continent : hodgsoni)
<i>Pitta cyanura</i>	—	—	cyanura	cyanura	irena
<i>Pomatorhinus montanus</i>	—	—	montanus	montanus	(Borneo etc. ; borneensis)

SPECIES.	SUMBAWA.	LOMBOK.	BALI.	JAVA.	SUMATRA.
<i>Enicurus leschenaulti</i> . . . . .	—	—	leschenaulti	leschenaulti	— (Borneo : borneensis)
<i>Geocichla citrina</i> . . . . .	—	—	rubecula	rubecula	— (Continent : citrina)
<i>Dicaeum minullum</i> . . . . .	—	—	sollicitans	sollicitans	— (Continent : olivaceum)
<i>Arachnothera affinis</i> . . . . .	—	—	affinis	affinis	— modesta
<i>Ploceus manyar</i> . . . . .	—	—	manyar	manyar	— (Continent : flaviceps)
<i>Dicrurus ater</i> . . . . .	—	—	longus	longus	— (Continent : ater)
<i>Picus vittatus</i> . . . . .	—	—	+	+	+
<i>Dryobates analis</i> . . . . .	—	—	+	+	+
<i>Thriponax javensis</i> . . . . .	—	—	javensis	javensis	javensis
<i>Rhipidura javanica</i> . . . . .	—	—	+	+	+
<i>Culicicapa ceylonensis</i> . . . . .	—	—	ceylonensis	ceylonensis	ceylonensis
<i>Hemipus obscurus</i> . . . . .	—	—	+	+	+
<i>Pericrocotus peregrinus</i> . . . . .	—	—	+	+	— (Continent etc.)
<i>Microtarsus melanocephalus</i>	—	—	melano- cephalus	melanocephalus	melano- cephalus
<i>Turdinus sepiarius</i> . . . . .	—	—	+	+	— (Malakka)
<i>Megalurus palustris</i> . . . . .	—	—	+	+	— (Continent etc.)
<i>Dicaeum trigonostigma</i> . . . . .	—	—	trigonostigma	trigonostigma	trigonostigma
<i>Amandava amandava</i> . . . . .	—	—	+	+	— (Continent)
<i>Munia maja</i> . . . . .	—	—	+	+	+
<i>Sturnopastor contra</i> . . . . .	—	—	jalla	jalla	jalla
<i>Gracula javana</i> . . . . .	—	—	javana	javana	javana
<i>Crypsirhina varians</i> . . . . .	—	—	+	+	+
<i>Ptilinopus porphyreus</i> . . . . .	—	—	+	+	+
<i>Spilornis bassa</i> . . . . .	—	—	+	+	+
<i>Microhierax fringillarius</i> . . . . .	—	—	+	+	+
<i>Ketupa ketupa</i> . . . . .	—	—	+	+	+
<i>Phodilus badius</i> . . . . .	—	—	+	+	+
<i>Anthracoeros coronatus</i> . . . . .	—	—	convexus	convexus	convexus
<i>Cacomantis merulinus</i> . . . . .	—	—	merulinus	merulinus	merulinus

SPECIES.	SUMBAWA.	LOMBOK.	BALI.	JAVA.	SUMATRA.
<i>Centropus sinensis</i>	—	—	bubutus	bubutus	bubutus
<i>Xantholaema rosea</i>	—	—	rosea	rosea	rosea
<i>Chlorura hyperythra</i>	? (Flores : ?intermedia)	intermedia	—	hyperythra	(Borneo : borneensis)
<i>Yungipicus sondaicus</i>	grandis	grandis	—	sondaicus	sondaicus
<i>Carpophaga lacernulata</i>	? (Flores : sasakensis)	sasakensis	williami	lacernulata	—
<i>Dicrurus cineraceus</i>	—	wallacei	cineraceus	cineraceus	(Palawan ?, Tenasserim ?)
<i>Eurystomus orientalis</i>	connectens	connectens	orientalis	orientalis	orientalis
<i>Centropus bengalensis</i>	sarasinorum	sarasinorum	javanensis	javanensis	javanensis
<i>Oriolus maculatus</i>	broderipi	broderipi	maculatus	maculatus	maculatus
<i>Phyllergates cucullatus</i>	— (Flores : everetti)	—	cucullatus	cucullatus	cucullatus
<i>Anthreptes malacensis</i>	chlorogaster	—	malacensis	malacensis	malacensis
<i>Mirafrja javanica</i>	parva	parva	javanica	javanica	—
<i>Alcedo meninting</i>	—	meninting	meninting	meninting	meninting
<i>Pycnonotus goiavier</i>	—	analisis	analisis	analisis	analisis
<i>Munia oryzivora</i>	—	+	+	+	+
<i>Geopelia striata</i>	maugeus	striata	striata	striata	striata
<i>Munia punctulata</i>	— (Flores etc. : blasii)	nisoria	nisoria	nisoria	nisoria
<i>Macropygia ruficeps</i>	orientalis	ruficeps ?	ruficeps	ruficeps	nana
<i>Collocalia linchi</i>	—	linchi	linchi	linchi	cyanoptila ?
<i>Pachycephala grisola</i>	—	grisola	grisola	grisola	" brunnei- cauda "
<i>Pericrocotus flammeus</i>	—	exsul	exsul	exsul	xanthogaster
<i>Horeites montana</i>	—	+	+	+	—
<i>Turdus varius</i>	—	horsfieldi	?	horsfieldi	(Continent : varius)
<i>Treron griseicauda</i>	—	griseicauda	griseicauda	griseicauda	—
<i>Macropygia unchall</i>	—	unchall	?	unchall	unchall
<i>Sphenocercus sphenurus</i>	—	korthalsi	?	korthalsi	korthalsi
<i>Orthotomus sepium</i>	—	sepium	sepium	sepium	cinerascens
<i>Munia leucogastra</i>	—	leucogas- troides	leucogas- troides	leucogastroides	leucogastra
<i>Ceyx rufidorsa</i>	innominata	innominata	innominata	innominata	rufidorsa
<i>Phylloscopus trivirgatus</i>	trivirgatus	trivirgatus	trivirgatus	trivirgatus	parvirostris ?
<i>Brachypteryx leucophrys</i>	+ ?	+	+	+	-
<i>Zosterops palpebrosa</i>	(Flores : neglecta)	neglecta	neglecta	O. : neglecta	(Continent : palpebrosa)

SPECIES.	SUMBAWA.	LOMBOK.	BALI.	JAVA.	SUMATRA.
<i>Dicaeum sanguinolentum</i>	? (Flores)	+	+	+	—
<i>Erythromyias dumetoria</i>	dumetoria	dumetoria	?	dumetoria	mülleri
<i>Corvus enca</i>	(Celebes : enca)	—	enca	enca	compilator
<i>Gallus varius</i>	+	+	+	+	—
<i>Pratincola caprata</i>	fruticola	fruticola	fruticola	fruticola	(Continent : bicolor)
<i>Ptilinopus melanocephalus</i>	melanocephalus	melanocephalus	melanocephalus	melanocephalus	—
<i>Macropygia phasianella</i>	? (Flores : emiliana)	emiliana	emiliana	emiliana	(Nias : modiglianii)
<i>Streptopelia bitorquata</i>	bitorquata	bitorquata	bitorquata	bitorquata	(Borneo etc. : dussumieri)
<i>Falco moluccensis</i>	occidentalis	occidentalis	occidentalis	occidentalis	—
<i>Geocichla andromedae</i>	? (Flores)	+	?	+	—
<i>Alcedo ispida</i>	floresiana	?	floresiana	bengalensis ?	bengalensis
<i>Lalage nigra</i>	timorensis	timorensis	timorensis	nigra	nigra
<i>Anthus richardi</i>	albidus	albidus	albidus	malayensis	malayensis
<i>Dicurus hottentottus</i>	bimaënsis	bimaënsis	bimaënsis	—	(Continent : hottentottus)
<i>Ramphalcyon capensis</i>	floresiana	floresiana	floresiana	capensis	malaccensis
<i>Gracupica tertia</i>	—	+	+	—	—
<i>Trichoglossus haematodus</i>	forsteni	mitchelli	mitchelli	—	—
<i>Ptilinopus cinctus</i>	albocinctus	albocinctus	albocinctus	—	—
<i>Pachycephala melanura</i>	fulvotincta	?	fulvotincta	—	—
<i>Stigmatops indistincta</i>	limbata	limbata	limbata	—	—
<i>Dicaeum mackloti</i>	? (Timor etc. : mackloti)	neglectum	—	—	—
<i>Munia quincolor</i>	(Flores : quincolor)	quincolor	—	—	—
<i>Zosterops intermedia</i>	+	+	—	+	—
<i>Ptilotis virescens</i>	? (Flores)	+	—	—	—
<i>Philemon timoriensis</i>	neglectus	neglectus	—	—	—
<i>Munia pallida</i>	? (Flores)	+	—	—	—
<i>Taeniopygia insularis</i>	+	+	—	—	—
<i>Calornis minor</i>	+	+	—	—	—
<i>Geocichla dohertyi</i>	+	+	—	—	—
<i>Pitta coronata</i>	? (Flores : concinna)	concinna	—	—	—

SPECIES.	SUMBAWA.	LOMBOK.	BALI.	JAVA.	SUMATRA.
<i>Monachalcyon fulgidus</i>	+	+	—	—	—
<i>Halcyon australasia</i>	(Sumba etc. : australasia) ?	australasia	—	—	—
<i>Cacatua parvula</i>	(Flores : occidentalis) ?	occidentalis	—	—	—
<i>Geoffroyus personatus</i>	sumbavensis	sumbavensis	—	—	—
<i>Otus manadensis</i>	albiventris	albiventris	—	—	—
<i>Falco longipennis</i>	+	+	—	—	—
<i>Baza subcristata</i>	timorlaoënsis	timorlaoënsis	—	—	—
<i>Megapodius duperreyi</i>	duperreyi	duperreyi	—	—	—
<i>Turnix rufilatus</i>	powelli	powelli	—	—	—
<i>Columba metallica</i>	metallica	metallica	—	—	—
<i>Acemonorhynchus annae</i>	+	—	—	—	—
<i>Zosterops wallacei</i>	+	—	—	—	—
<i>Lophozosterops dohertyi</i>	dohertyi	—	—	—	—
<i>Munia molucca</i>	propinqua	—	—	—	—
<i>Gracula venerata</i>	+	—	—	—	—
<i>Graucalus floris</i>	+	—	—	—	—
<i>Pericrocotus lausbergi</i>	+	—	—	—	—
<i>Rhipidura diluta</i>	sumbawensis	—	—	—	—
<i>Collocalia esculenta</i>	esculenta	—	—	—	—
<i>Zosterops sumbavensis</i>	+	—	—	—	—
<i>Dicaeum igniferum</i>	+	—	—	—	—

CONTRIBUTIONS TO A KNOWLEDGE OF THE SUB-FAMILIES *OENOCHROMINAE* AND *HEMITHEINAE* OF *GEOMETRIDAE*.

BY LOUIS B. PROUT, F.E.S.

THE Geometrid subfamilies treated of in this paper have already undergone a preliminary revision at my hands (*Genera Insectorum*, fasc. 104, 1910, and 129, 1912), but insufficiency of material, lack of time or occasion for real monographic work, and various other circumstances made it impossible to avoid a number of uncertainties and even errors in matters of detail. Moreover, many new species and forms have recently been discovered, in particular among a rich collection made at Mt. Goliath, 5000—7000 ft., Central Dutch New Guinea (about 139° E. long.), by Mr. A. S. Meek. I therefore take this opportunity not only to describe the novelties but also to introduce various notes and corrections concerning earlier work.

As I hope shortly to publish a catalogue of the *Hemitheinae* in the "Lepidopterorum Catalogus," it is not necessary here to refer to discoveries of synonymy which need no particular comment, nor to give a list of the new species which have been published since the appearance of my work on the "Genera Insectorum"; but, with these exceptions, I shall endeavour to bring our knowledge as nearly as possible up to date in all essentials, deeming it a manifest advantage to have the whole within the same covers rather than spread over a number of detached notes. For this reason no fannistic limits have been prescribed, although the New Guinea Geometrids claim by far the largest share of attention.

SUBFAMILY *OENOCHROMINAE*.

1. *Dichromodes semicanescens* spec. nov.

♀, 18 mm. Head, with face, fuscous sprinkled with grey. Palpus fuscous, whitish at base. Thorax and abdomen concolorous with wings. Fore and middle legs and hindtarsus fuscous on upper side, narrowly pale-belted.

*Forewing* rather short and broad, apex not acute, termen bowed, not strongly oblique; mostly grey in basal part, cell and entire area posterior to M and M<sup>2</sup>, with coarse fuscous irroration; basal part of cell and of costal area slightly mixed with light ferruginous-ochreous; stronger longitudinal patches of the same distally to cell, placed between SC<sup>5</sup> and R<sup>2</sup> and between R<sup>3</sup> and M<sup>1</sup>, reaching as far as a dark fuscous border, which runs from costa to tornus, about 2 mm. wide anteriorly but narrowing to a point at tornus; first line fine, dark fuscous, indistinct, from a thick black spot at one-fourth costa; a thick black costal spot proximally to cell-spot, another distally to it; cell-spot black, continued with fuscous posteriorly along DC; postmedian line scarcely traceable.—*Hindwing* uniform fuscous, only the inner margin slightly paler, with indications of beginnings of lines.

Underside shining greyish fuscous, forewing only with somewhat darker border, hindwing with rather more brown tinge, rather less shiny, a dark discal spot and dark border.

Geraldton, West Australia (E. A. Saunders). Type in coll. Brit. Mus.



2. *Nearcha agnata* spec. nov.

♂, 35 mm. Face blackish. Palpus about twice diameter of eye; black, at base whitish. Antennal pectinations about as in *aridaria* Walk. Head, thorax, and abdomen concolorous with wings. Forefemur darkened; middle femur hairy (hind abraded); hindtibia with strong ochreous hair-pencil.

*Forewing* with apex prominent, termen waved, curved, oblique; pale ochreous grey with very sparse dark scales; first line obsolete; postmedian, as in normal *aridaria*, consisting of a curved row of black vein-spots, becoming small and less distinct costally, closely followed (except at costa) by a curved brown line; a small dark, pale-centred discal spot (smaller than in *aridaria*); terminal black dots rather larger than in *aridaria*; fringe strongly dark-checkered, remaining pale opposite the veins.—*Hindwing* slightly paler, with dark cell-dot before one-third and feeble grey, nearly straight line beyond middle.

Forewing beneath with cell-spot not pale-centred; no other markings. Hindwing beneath slightly hairy at base; hair-tufts ochreous, placed as follows: a moderate black-mixed tuft in front of vein C just before apex of cell, and a similar one, but not black-mixed, in front of M in the end of the cell; ridges along vein C from the tuft about half-way to the end of the vein, and on M and especially the base of R<sup>3</sup>; a large tuft at the base of and for some distance along and between SC<sup>2</sup> and R<sup>1</sup>; markings consist of a moderately large black cell-spot on DC<sup>2</sup> and a black spot at tornus; terminal spots and fringe as on forewing.

Perth, West Australia (C. M. Worsfold). Type in coll. Brit. Mus.

Belongs to Section I. (*Gen. Ins.* 104, p. 29), nearest *aridaria*, but differing in the arrangement of the hair-tufts as well as in some details of wing-shape and markings.

3. *Nearcha uncta* spec. nov.

♂, 33 mm. Face black. Palpus moderately long, black. Antenna two-thirds length of wing; shaft ochreous, pectinations long, blackish. Crown of head mixed ochreous and blackish, rather rough, projecting a small tuft anteriorly. Thorax and abdomen concolorous with wings. Legs long and slender, femora glabrous; whitish grey, more or less speckled with fuscous; forecoxa, femur, and tibia predominantly fuscous.

*Forewing* with costa very slightly curved at base and close to apex, otherwise straight, or almost concave; termen straight, oblique; very glossy blackish grey with a faint purplish reflection, costal edge narrowly ochreous; first line from one-fourth costa to one-third posterior margin, consisting of large white dots on veins and cell-fold; discal spot at beyond one-half, large, dark, but little conspicuous on the dark ground; postmedian wavy, brownish, at 3.5 mm. from termen, slightly incurved posteriorly, quite indistinct, but marked with sharp white dots on the veins, smaller than the antemedian series; a conspicuous pale, thick, regularly dentate subterminal line; distal margin tinged with blue-grey, with a conspicuous series of small black dots; fringe divided by a pale line beyond middle.—*Hindwing* with costa long, apex rounded-prominent, termen straight nearly to the rounded tornus; paler, unmarked, terminal dots as on forewing.

Under-surface almost unmarked, both wings with cell-spot indicated, forewing with a faint postmedian line, hindwing dark-speckled and strigulated.

Waroona, West Australia, May 27, 1909 (G. F. Berthoud). Type in coll. Brit. Mus., paratype in coll. G. Lyell, Gisborne.

Related to *pseudophaea* Lower; very distinct in its very dark, very glossy coloration.

#### 4. *Ophiographa postmarginata* spec. nov.

♂ ♀, 24–25 mm. Frontal protuberance rather less long than in *serpentaria*, ending, as in that species, in a long, curved, horny point. Head and thorax colorous with forewing, mixed with dark fuscous. ♂ antennal pectinations long; ♀ hindtibia with terminal spurs only.

Both wings in ♂ with termen very feebly, in ♀ rather more (but still only slightly) subrenulate.—*Forewing* with termen strongly bowed, becoming very oblique;  $SC^{2-3}$  anastomosing ( $SC^2$  at a point only) with  $SC^1$ ,  $M^1$  well separate from  $R^3$ ,  $DC^1$  rather more vertical than usual; pale reddish grey, mixed, especially in basal area, with red-brown, a sparser dusting of fuscous scales in the same area (and in the ♀ in the distal area); costal margin as far as first line more fuscous; first line fuscous, from costa at beyond two-fifths to posterior margin at about (or before) one-half, strongly dentate, the sharpest teeth on the veins and submedian fold, pointing proximad; second line crenulate, 2.5 mm. from termen, nearly parallel therewith, slightly incurved between  $R^1$  and  $R^3$  and in submedian area, in ♀ obscured by fuscous shading; cell-spot weak; terminal line fuscous, thickening between the veins; fringe whitish.—*Hindwing* with  $SC^2-R^1$  connate; white with a small dark cell-dot, feeble sinuous postmedian line and a fuscous terminal shade, in the ♂ 1.5 mm. broad, but in the ♀ occupying half the wing, crossing the postmedian line; terminal line and fringe as on forewing.

Forewing beneath rather paler, almost unmarked, the postmedian indicated by a dark spot on costa, accompanied distally by a pale one. Hindwing beneath whiter than forewing, the cell-spot well marked, the postmedian and the terminal shade indicated, the former accompanied proximally by a small fuscous costal blotch.

Sherlock River, West Australia (E. Clements). Type (♂) and paratype in coll. Brit. Mus.

Evidently near *dilutaria* Warr.

#### 5. *Lissocraspeda pygmaea* spec. nov.

♂, 20 mm. Head and palpus fuscous, more or less mixed with whitish, a bar on forehead blacker, vertex more strongly mixed with white; the strong frontal prominence ending in two small pointed processes. Antennal pectinations long. Thorax above fuscous, mixed with whitish; abdomen paler, with narrow fuscous belt at end of each segment. Legs mixed with fuscous and whitish.

*Forewing* fuscous, mixed with blackish, obscuring the markings; antemedian line blackish, only indicated as a short mark at about one-third costa; postmedian blackish, slender, sinuous, at about 2 mm. from termen, thickest and most distinct at costa, faintly traceable throughout, the inward curves between radials and in posterior half; terminal line thick, black, interrupted.—*Hindwing* white, dusted with fuscous near termen, with two fuscous spots or beginnings of lines at distal part of inner margin and a fuscous tornal blotch containing the darker beginning of a third line; an interrupted fuscous terminal line.

Forewing beneath much paler, darkest at costa and apex, unmarked; hindwing white, with coarse fuscous speckling costally, terminal line as above.

Sherlock River, West Australia (E. Clements). Type in coll. Brit. Mus.

#### 6. *Homospora lymantriodes* spec. nov.

♂, 35 mm. Structure as in the type species (*rhodoscopa* Lower), but  $SC^1$  of forewing anastomosing at a point with C,  $R^2$  of hindwing more strongly approximated at its origin to  $R^1$ ; wing slightly broader (less elongate) than in the only example of *rhodoscopa* before me. Head, body, and legs concolorous with wings, only the abdomen dorsally with bright golden-brown patch on basal segments, as in the type species.

*Forewing* very light, whitish brown with a tinge of fawn-colour, the costal edge with some small fuscous dots; two lines and central shade strongly expressed, fuscous; first line from before one-third costa to one-third hind-margin rather thick, excurved in cell, somewhat inangled on M and  $SM^2$ ; median shade thick, placed very near second line; second line from three-fourths costa to near tornus, dentate outwards on all the veins, and very faintly incurved from  $R^1$  to  $R^3$  and from  $M^1$  to  $SM^2$ .—*Hindwing* whiter, with a weak postmedian line, accentuated by darker vein-spots, a vague fawn-tinged band proximal to it and some shading at apex.

Forewing beneath with first line obsolete, median shade faint, postmedian moderately developed; hindwing beneath not whiter than forewing.

Sherlock River, West Australia (E. Clements). Type in coll. Brit. Mus.

Texture and coloration somewhat recall some Lymantriids.

#### 7. *Oncodes leptoctenopsis* spec. nov.

♂, 30 mm. Face crimson, mixed with fuscous, narrowly edged with fulvous beneath. Palps fulvous, mixed with crimson. Vertex and antennal shaft bright fulvous or reddish fulvous. Thorax and abdomen concolorous with wings; pectus and forecoxa somewhat hairy. Fore- and midfemur and midtibia mixed with pink, foretibia and fore- and midtarsus fuscous above, both tibiae and tarsi with yellow spots, on the latter at ends of joints.

Wings fulvous-brown, with sparse dark dots and strigulae.—*Forewing* with costal edge narrowly bright fulvous, narrowly followed from base to perhaps one-fourth by a delicate pinkish shade; two small purplish-fuscous marks on costa, such as in *traumataria*, the first at two-fifths, somewhat rhomboidal, the second (a flattened triangle) midway between this and apex; a purple-fuscous line, oblique and slightly curved, from close before apex towards middle of posterior margin, closely accompanied proximally by a ferruginous brown line, which runs to the middle of the posterior margin and is continued (more overlaid with purplish) on the hindwing; some apical markings similar to those of *traumataria*, some ferruginous to fuscous wedges distally to the oblique line between the radials and anteriorly; fringe slightly darkened with ferruginous, purplish-fuscous at apex.—*Hindwing* without markings, except the line.

Underside fulvous without definite markings, a pinkish-white dash at apex of forewing, succeeded by a vague, pale, fulvous-brown, oblique line to middle of wing; costal edge of forewing clear bright fulvous, the rest of the wing irrorated with darker shades—dull reddish distally, brighter pink near posterior margin,

otherwise dull purplish-fuscous, posterior margin itself whitish; hindwing less irrorated, but with similar shades.

Mount Goliath, January—February 1911 (A. S. Meek). Type and three other ♂♂ in coll. Rothschild.

The wings are less produced apically than in the type species, scarcely longer than in the South American genus *Leptoctenopsis*, to which (e.g. to *L. subpurpurea* Warr.) the new species bears a curious superficial resemblance. In the forewing SC<sup>3</sup> anastomoses with SC<sup>4</sup>, as is normal in this group; in the hindwing SC<sup>2</sup> and R<sup>1</sup> are well stalked. Evidently variable; one specimen is of a lilacine colour, only weakly mixed with fulvous, the postmedian line rather faint, the distal wedge-marks large and very black.

#### 8. *Gerusia polydaedala* spec. nov.

♂, 47 mm.; ♀, 56 mm. Face brown, narrowly whitish above and beneath. Palpus varied olivaceous grey, red and fulvous. Vertex and antennal shaft fleshy grey; collar and extreme front of thorax dark olivaceous grey, somewhat mixed with brown. Thorax and abdomen above pinkish grey, with a slight violaceous tone and with a few dark atoms; thorax beneath very pale olivaceous grey; abdomen in ♀ very robust, beneath fulvous somewhat mixed with ferruginous. Forecoxa, inner side of forefemur, middle- and hindfemora and tibiae fulvous, spotted and blotched with red.

Wings in ♂ with termen irregularly crenulate, especially the hindwing, which projects about R<sup>3</sup> and M<sup>1</sup> and bears the strongest tooth at R<sup>3</sup>; in ♀ almost entire-margined, the forewing (as in ♂) with slight curved excision behind apex, then strongly gibbous, hindwing only very weakly undulate. Forewing with SC<sup>1</sup> anastomosing with C (at a point in ♂, rather strongly in ♀); hindwing with C in ♂ normal, in ♀ closely appressed to SC, but not anastomosing.

Coloration exceedingly variegated.—*Forewing* with the prevailing tone fleshy- or somewhat violet-grey, with some dark dusting (especially in the ♂), basally and distally somewhat paler than in the intermediate area, in the ♀ (especially distally) slightly more yellowish-tinged; a small dark discal spot; antemedian dark line indented on SC and the submedian fold, excurved between, oblique outwards to posterior margin (in ♀ nearly obsolete, excepting the posterior end); two thick, ill-defined red-brown lines from costa, the first (median) starting at two-fifths, running very obliquely to posterior angle of cell, here bent at a right-angle, but becoming almost obsolete, vaguely traceable again as a blotch at posterior margin; postmedian starting similarly obliquely to R<sup>1</sup>, where it forms an acute angle, becomes fine, black, and denticulate, and runs about parallel with termen as far as submedian fold, finally again brown and outbent to posterior margin; in the ♀ only, an oblique line, black at first, then brown, runs from apex and closely accompanies the postmedian distally; apical region somewhat dark-clouded, a white subapical spot between SC<sup>5</sup> and R<sup>1</sup>, in the ♂ extended to costa near apex as an interrupted white line, in the ♀ merely accompanied anteriorly by a minute white dot; twin black subterminal spots on either side of R<sup>2</sup>.—*Hindwing* still more brightly variegated; prevailing tone in the cell ochreous, somewhat marked with reddish, a small blotch of the same on R<sup>2</sup> submarginally, and a paler one near tornus; between cell and SM<sup>2</sup> whitish, coarsely spotted with olive-grey; inner margin in ♀ reddish, in ♂ whiter, in both marked with fuscous; a small dark cell-spot and two thick transverse lines of reddish-grey or olive-grey at equal

distances proximally and distally to it, the latter in the ♀ nearly lost in olive-grey clouding which follows it, occupying much of the distal part of the wing; in the ♂ the grey clouding is chiefly confined to the tornal half of the area; apex and extreme tornus mostly pinkish in the ♀, pale in the ♂, distal area about the medians rather violet-grey than olive-grey, and containing two small red-brown blotches (large spots).

Under-surface with the colouring somewhat similarly arranged, but stronger and brighter, the distal area of the hindwing in the ♀ largely, in the ♂ in tornal half rufous; both wings with small black submarginal spots on either side of  $R^2$  and hindwing with one between  $M^2$  and submedian fold; ♂ forewing with the pencil of dark hairs which characterises the typical section of *Gerusia*.

Ninay Valley, Central Arfak Mountains, Dutch New Guinea, 3500 ft., November 1908—January 1909, ♂ (type) and ♀ in coll. Rothschild.

There is no room to doubt that these are sexes of a single species, but the differences in shape, and especially in hindwing venation, are very curious and very disturbing taxonomically. They render my sectional arrangement of the genus (*Gen. Ins.* 104, p. 54) untenable, for the ♂ would fall into Section I., the ♀ into Section III. The general coloration and effect of the upperside are remarkably suggestive of the Australian *excusata*, which is intermediate in shape between the sexes of *polydaedala*, has a less brightly coloured underside, and lacks the pencil of hairs. The other Australian species, *multicolora* Lucas, is also near; in it and *polydaedala*—the only two of which I have seen the sex—the ♀ has shortly pectinate antenna and a stronger anastomosis of  $SC^1$  of the forewing than I indicated in my diagnosis; but *multicolora* is normal in the anastomosis of C of the hindwing.

As ab. *maculata* ab. nov. I describe a form with a black blotch in the submedian area of the forewing distally to the postmedian line. Mount Kebea, British New Guinea, 3000 ft., July 1903 (A. E. Pratt) 2 ♂♂ in coll. Bethune-Baker. As these two entirely agree, and have also a slightly less brightly variegated underside than the type form, it is just possible that they represent a local race; but the known inconstancy of these dark blotches, and especially the exact analogy of the allied *G. virescens* Warr. and ab. *viridimacula* Warr. (*Nov. Zool.* xiv. p. 120), render it most probable that they will prove to represent an aberration only.

#### 9. *Sarcinodes subfulvida* ab. *flaviplaga* ab. nov.

♂. Bright liver-coloured, but distinguished from the hitherto described forms in having a large patch of yellow occupying a great part of the distal half of forewing; this starts at the end of the cell, with an irregular proximal boundary (encroached upon by the ground-colour in the posterior angle of cell) and extends, in its longer measurement, from close to the apex to  $SM^2$ : distally it projects roundly into the ground-colour on the medians and just behind  $R^3$ , and comes nearer the termen (about 2-3 mm.) in anterior half, while it is almost connected between the radials with a second, but less pure yellow terminal patch which extends from  $R^1$  to  $M^1$ . Hindwing with ill-defined yellow patch in centre. Postmedian line in both wings very fine and yellow, on forewing accompanied proximally by small blackish vein-dots.

Near Octakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type in coll. Rothschild.

10. *Corium iridoptera* spec. nov.

♂ ♀, 28–31 mm. Similar to *hyperphyes* Prout, *Ann. Mag. Nat. Hist.* (8) viii. p. 704, but smaller; forewing similarly shaped, the apex acutely produced, hindwing with termen more convex. Structure about as in *hyperphyes*, of which the British Museum now possesses, in addition to the type, a ♂ and ♀ from Aberdare Mountains, British East Africa (7000–8500 ft., S. A. Neave). Antennal ciliation in ♂ very short (less than one-half diameter of shaft) and even; ♂ hindtibia with short hair-pencil from femoro-tibial joint; ♂ abdomen basally clothed beneath with strong brown hairs, which are not observable in *hyperphyes*.

Bluish white, with very strong iridescence; discal and terminal dots small, the latter in particular strikingly different from the large bold dots of *hyperphyes*; antemedian and postmedian series of dots rather weak, the postmedian less incurred posteriorly than in *hyperphyes* and less prolonged into dashes; costal margin of forewing scarcely tinged with grey; terminal grey line (which in *hyperphyes* thickens at the vein-ends) very fine and sometimes almost obsolete.

British East Africa, the ♂ (type) and 2 ♀ ♀ from N. Kavirondo, Nasiri Hills, 4800 ft., June 14, 1911 (S. A. Neave) in coll. Brit. Mus. A pair from south and east slopes of Mount Kenya, 5000–7000 ft., February 8, 1911, are probably conspecific, but measure 34–37 mm., and the ♂ abdomen beneath is dark-haired throughout.

11. *Callipotnia angulifera* spec. nov.

♂ ♀, 42–45 mm. Rather larger than *multicolor* Warr., *Nov. Zool.* vi. p. 323.

*Forewing* with distal margin slightly more oblique, the wing thus appearing more pointed at apex; colour somewhat warmer brown (especially in the ♂, which at the same time is more sprinkled with fuscous), postmedian line uninterrupted, usually rather more pointed (in *multicolor* rounded) at R<sup>3</sup>, from thence to posterior margin forming a gentle, regular inward curve; its colour deeper, more ferruginous, accompanied distally by a fine yellowish line; no round dark spot on posterior margin.—*Hindwing* also with a continuous, similarly coloured and similarly accompanied postmedian, which is right-angled on R<sup>3</sup>, thence nearly straight in both directions.

Under-surface dull reddish, strongly suffused with olive-grey, thus much more sombre than in *multicolor*; markings obsolete excepting a discal spot and postmedian line, the latter on forewing much less projecting in middle, on hindwing more angled in middle, than in *multicolor*; ♂ hair-tuft coloured as in *multicolor*.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October–December 1910 (A. S. Meek). Type (♂) in coll. Rothschild. Also a pair from the Upper Setekwa River, in the same district, 2000–3000 ft. August 1910, in coll. Rothschild.

12. *Celerena remutata* spec. nov.

♀, 62 mm. Probably related to *mutata* Walk., *List Lep. Brit. Mus.* xxxi. p. 167, but with the dark border of both wings reduced to about the extent of that of *mitis* Warr., the oblique dark band from midcosta of forewing not joining the border near tornus but separated by a small space of the ground-colour as in *triflava* Warr. From both *mitis* and *triflava*, *remutata* differs in the rather less deep golden ground-colour and less black borders (varied with grey as in *mutata*, etc.)

with less crenulate proximal edge ; from the former also in the separation of central band from tornus, and from the latter in the absence of subapical yellow patch.

Mount Kebea, British New Guinea, 3000 ft. July 1903 (A. E. Pratt). Type in coll. Brit. Mus.

#### **Cartaletis Warr.**

My division of this genus into sections (*Gen. Ins.* 104, pp. 100–101) is not quite correct. "Section II.—Build slender," etc., should stand at the top of p. 101; *forbesi* and *concolor*, which Warren placed in *Cartaletis*, certainly belong to his *Leptaletis*, i.e. the slender section. Indeed Butler's **type** of *variabilis* (the name-type of *Leptaletis*) seems conspecific with *concolor*; the *ampliflora* forms may possibly represent a separate species, and so may the redder *forbesi* Druce, but material which is accumulating seems to indicate that we are dealing with one polymorphic species, as is also believed to be the case with *C. libyssa* = *monteironis* = *ethelinda*.

#### 13. **Cartaletis libyssa euparypha** subsp. nov.

♂ ♀, 60–66 mm. Slightly larger than the typical eastern race, somewhat brighter fulvous (less reddish), the white spots on the thorax more strongly developed, marginal band of forewing somewhat differently shaped, its proximal edge being more strongly curved or even bent in the middle; submarginal spots of both wings purer, less creamy white, the subapical of forewing narrower, one or two additional spots behind M<sup>2</sup>, the entire series on the hindwing larger than in the type form.

Congo, without more exact locality. Type (♂) and paratype in coll. Brit. Mus.

#### 14. **Parapychodes perfulva** spec. nov.

♂, 33 mm. Differs from the type species (*tenuis* Butl.) in having the subapical blotch of the forewing fulvous, not white. The yellowish-fulvous face has a larger and deeper black spot on the upper part than in any specimen of *tenuis* before me; the abdomen is as bright fulvous as the wings, not more whitish, as is usually the case in *tenuis*. Wings narrow, hindwing with a strong inner-marginal fold, reaching nearly to M and M<sup>2</sup>, and mixed with black on the upper surface. Unfortunately I am only able to compare ♀ ♀ of the type species.

Witu, British East Africa, February 28, 1912 (S. A. Neave). Type in coll. Brit. Mus.

A ♀ much larger (54 mm.) from Mozambique (coll. Brit. Mus. ex coll. Distant) agrees in the fulvous subapical patch, but differs in that this reaches the costal margin, the narrow black costal edging of the forewing failing entirely, though there is a small black mark at base and another at before one-third, and the hindwing has a complete, though rather narrow, black distal border, into which the ground-colour projects somewhat between the veins; upper part of face not black.

#### 15. **Parapychodes costimaculata** spec. nov.

♀, 61 mm. Head fulvous, with a broad black band across upper part of face and a large black spot in middle of vertex. Palpus black, first and second joints fulvous beneath. Antenna thick, black, closely lamellate, without the short pectinations of *tenuis*. Thorax fulvous, broadly black mediodorsally and mixed with black beneath. Abdomen fulvous above, whitish yellow beneath; belted with black at ends of segments.

Wings fulvous.—*Forewing* marked with black at the extreme base and along costa for 2 or 3 mm.; a black spot extending 2 or 3 mm. on costa at nearly one-third; a black apical patch of about the same extent as in *tenuis*, containing a more extended and irregular white patch than that species, the black remaining only as: a broad oblique band from costal margin half-way to posterior margin, constricted at end of cell by a triangular encroachment of the ground-colour, a moderate apical patch continued to beyond  $M^2$  as a rather narrow distal band, and a projecting prong from this latter along  $M^1$  to near the costal band.—*Hindwing* with a narrow black border, broadest at apex, its posterior half consisting of three large, somewhat round-edged blotches whose centres lie on veins  $R^3$ ,  $M^1$  and  $M^2$ , and which are only very narrowly connected on the margin itself.

Under-surface the same.

Ndzooimi, Lagos district, Southern Nigeria, June 10, 1911 (W. A. Lamborn). Type in coll. Oxford Museum.

Colour and structure (except antenna) as in the East African *tenuis* Butl.; a pair of short median spurs present on the hindtibia.

#### 16. *Ergavia costimaculata* spec. nov.

♂, 50 mm. Antenna pectinate, the branches very short—only about the length of diameter of shaft. Hindtibia with a single spur.—*Forewing* without areole, both wings with  $DC^3$  strongly incurved,  $M^1$  separate. Head, body and wings light wood-brown, marked with dark reddish-brown. Face, palpus, antennal shaft and dorsum of abdomen coarsely spotted; vertex, thorax and wings clearer, except front of thorax, which is wholly dark.

*Forewing* with the usual raised black cell-mark; a large costal blotch at base, reaching nearly to first line, a triangular one from first line to cell-spot and a smaller subapical; lines black, the first from costa beyond one-fourth, forming a very strong outward curve in cell, and a strong outward angle on  $SM^2$ , thick from costa to mid-cell, thick-spotted at base of  $M^2$ , in fold and on  $SM^2$ , otherwise very indistinct; second line weak in parts, starting from a blackish spot on costa, following about the same course as in most of the genus, thick on most of the veins; subterminal line pale, dentate, extremely indistinct except against the subapical blotch, on either side of  $R^2$ , where it is accompanied proximally and distally by dark spots, and behind  $M^2$ , where it is similarly accompanied; termen with large dark dots between the veins; fringe irregularly dark-spotted.—*Hindwing* with the raised discal mark black; the black postdiscal line stronger than on forewing, with slight tooth outward on C, two stronger, even ones on  $SC^2$  and  $R^1$ , a regular sinus between the radials and blunt teeth at  $R^3$  and  $M^1$ ; traces of a much weaker, irregular, diffuse brown line nearer base, crossing end of cell; the area between the two lines, except costally, filled up with red-brown; some dark spots proximally to the very faint subterminal line in costal half of wing and between  $M^2$  and margin.

Underside of forewing suffused with reddish, postdiscal line of both wings traceable, chiefly by dark vein-dots, that of forewing distinct from  $M^2$  to margin; both wings with small black cell-mark and with the subterminal blotches present.

Allianca, below S. Antonio, Rio Madeira, November—December 1907 (W. Hofmanns). Type in coll. Rothschild.

Like *drucei* Schaus, but with pectinations less than half the length.



## SUBFAMILY HEMITHEINAE.

17. *Pingasa multispurcata* spec. nov.

♀, 36-39 mm. Face broadly black above, narrowly whitish below. Palpus two and a half times diameter of eye, pale, dark-mixed above. Thorax and abdomen concolorous with wings. Foreleg strongly, middle and hindleg slightly fuscous above, with the ends of the joints remaining pale.

Wings above similarly coloured to *tephrosiaria* Guen., but much more heavily dark-sprinkled, antemedian line much less strongly outcurved, postmedian less deeply dentate.—Hindwing with the raised scales almost wanting.

Under-surface white, slightly more dusted than in *tephrosiaria*, the discal marks, at least on forewing, strong, subterminal band on both wings narrow, not connected with termen by dark shading between the radials; on forewing continuous or nearly so, constricted or slightly interrupted at the veins, on hindwing much narrowed or interrupted at costa and about  $R^3-M^1$ , broadened between the radials.

Rawal Pindi (type), Campbellpur, July 25, 1886 (paratype), both in coll. Brit. Mus.

A distinct little species, hitherto apparently overlooked. Although both examples are in good condition they show scarcely a trace of the tufts of raised scales on the hindwing, but they are in every other respect absolutely typical *Pingasa*.

18. *Pingasa alba brunnescens* subsp. nov.

Differs from the type form (*Pingasa alba* Swinh., *Tr. Ent. Soc. London*, 1891, p. 491) in having the upper surface coarsely sprinkled throughout with light ochreous-brownish; postmedian line rather thick, intensely black. On the under surface the postmedian is also discernible, blackish, the broad band which follows it usually more tinged with brownish or smoky, hence distinctly differentiable, only in the pair in coll. Wileman merged with the line.

Gifu, 1886, 2 ♂♂ 2 ♀♀ (ex coll. Pryer); Ningpo, July 1886, 1 ♀; all in coll. Brit. Mus. Himi (?), Iyo, June 29, 1896, 1 ♂ 1 ♀ in coll. Wileman.

This is the *Pseudoterpnia alba* of Leech (*Ann. Mag. Nat. Hist.* (6) xx. p. 228), but although both he and I (*Seitz Macrolep.* iv. p. 10) noticed the colour variation, it has not yet been registered as a subspecies. After examining all the material accessible to me I am, however, convinced that the differences are constant. Some examples (chiefly ♀) are more darkened than others, the Ningpo and Iyo examples in particular. The latter two have the band beneath very broad and black, almost reaching the termen.

19. *Pingasa nobilis* spec. nov.

♂, 56 mm. Face ochreous, without dark bar above. Palpus paler, beneath white, proportions as in *ruginaria* Guen. Vertex white tinged with grey. Thorax white, above tinged with grey; abdomen white, dorsally sprinkled with ochreous, crests small, slightly ochreous, minutely black on either side, anal tuft and tuft at base of abdomen beneath ochreous. Hindtibia strongly dilated, without terminal process, tarsus barely over three-fifths tibia.

Wings shaped as in *ruginaria*, white, somewhat purer than in that species; the speckling mostly grey, mixed with red at inner margin of hindwing.—*Forewing* with first line blackish, at costa thick, deep velvety black, its course as in

the allies, the angle on submedian fold acute; discal mark normal, elongate; both wings with postmedian line formed about as in *rufofasciata* Moore, but thicker, distal area deep purple-grey, as in the darkest *ruginaria*, leaving a white midterminal blotch on both wings.

Under-surface nearly as in *ruginaria*, the basal yellow shading more restricted, on forewing slight except along costal margin.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type in coll. Rothschild. Also Haidana, Collingwood Bay, April 1907, and a short series from Kumasi River, British New Guinea, at low elevation, May, August and September 1907, all in coll. Rothschild.

Differs from *chlora*, *ruginaria*, etc., in the more ochreous, not black-banded face, and in having the postmedian line neither deeply dentate nor in its middle outcurved. In all these respects nearest the Assam form of *rufofasciata* Moore, which is smaller, the darker borders of a totally different colouring, the underside with more yellow, etc. The teeth in the postmedian line are moreover really more intermediate towards those of *chlora*, and that on  $SM^2$  of the forewing is rather pronounced.

#### 20. *Pingasa victoria* spec. nov.

♀, 46–47 mm. Shape and structure of *chlora* Cram. (palpus 3.5 mm. long, third joint fully 1.5 mm.). Face black in upper half, whitish ochreous in lower. Palpus white beneath, more tinged with ochreous above. Vertex, thorax and abdomen concolorous with wings. Fore- and middle-legs blackish above and on inner side, spotted with white at the ends of the joints.

Wings coloured as in the coldest (least red-mixed) *chlora*; lines rather fine, grey-blackish, on forewing arising from deep black costal spots; first (on forewing only) at 5.5 mm. from base, only very gently outcurved in cell and submedian area; postmedian of forewing from costa at 12 mm., running somewhat outwards to  $R^3$  5 mm. from termen, the tooth on  $R^1$  slight, that on  $R^2$  extremely slight or wanting, teeth on  $R^3$  and  $M^1$  equidistant from termen, those of  $M^2$  and  $SM^2$  slightly farther from it (a very slight proximal curve of the line in its posterior part); postmedian of hindwing approximately parallel with termen, except near apex, the teeth quite moderate, the proximal curve between the radials slighter than in *chlora*, the tooth on  $R^2$  minute or wanting.

Under-surface white, both wings with rather narrow black distal band, that of forewing leaving a white spot at apex and white band from  $R^3$  and not quite reaching posterior margin; that of hindwing leaving narrow, irregular marginal band, nearly or quite interrupted by the black about  $R^2$ ; forewing with small black cell-mark, hindwing without.

Victoria Falls, Rhodesia, February 16, 1911 (L. A. Sabine). Type in coll. L. B. Prout. A second example from Barberton, Transvaal (L. de Beer) in coll. A. J. T. Jaanse, Pretoria.

Distinguished by the little outcurved antemedian line and the outward sweep in the middle of the postmedian of the forewing.

#### 21. *Hypodoxa fulgurea* spec. nov.

♂ ♀, 46–54 mm. Face olivaceous ochreous, darker mixed below. Palpus mixed olivaceous and fuscous above, reddish mixed with white beneath. Thorax

and abdomen above concolorous with wings, beneath (and on sides of abdomen) bright golden yellow, the breast pink.

Wings very varied with pink, white and blue-grey scales, and in places with olive-ochreous; lines and some costal spotting on forewing black.—*Forewing* with a line close to base, obsolete costally, outangled on M and SM<sup>2</sup>; antemedian from two-sevenths costa to near one-third of posterior margin, indented on veins, excurved between; postmedian from nearly two-thirds costa to beyond middle of posterior margin, commencing about vertically, very gently incurved between the radials, markedly toothed on R<sup>3</sup> and M<sup>1</sup>, then retracted basewards but with a further tooth on M<sup>2</sup>, approximately parallel with antemedian (3—4 mm. distant from it) from behind M<sup>2</sup> to posterior margin; discal mark elongate, ill-defined; subterminal line whitish, consisting of a series of long teeth; terminal line black, slightly interrupted anteriorly; between the basal and antemedian lines there is an ill-defined whitish band; proximally to the antemedian and distally to the postmedian (especially in the ♂♂) narrow, ill-defined olive-ochreous bands, and some similar shading appears in the distal area, especially in the middle.—*Hindwing* with the postmedian, subterminal and terminal lines, the first-named narrowly followed by *whitish*; distal area as on forewing; tufts of raised scales mostly dark grey; abdominal margin and its fringe bright golden yellow.

Underside of forewing mostly pink in proximal half, costally olive-ochreous or bright yellow, a large roundish black discal spot, followed by a small white patch; a velvety blackish, violet-mixed distal band, leaving free a small pale apical space. Hindwing beneath bright golden yellow in proximal half, then narrowly white, distally broadly blackish, less intense and more mixed with violet terminally.

The sole ♀ before me, besides its larger size, is characterised by a much stronger admixture of blue-grey above (here almost black), especially between postmedian line and termen, though leaving on forewing a pale apical patch.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type ♂ and a ♀ in coll. Rothschild. Also a ♂ from the Upper Setekwa River, September 1910, in coll. Rothschild, and one from Mount Kebea, British New Guinea, 3600 ft., July 1903, in coll. Bethune-Baker.

Resembles the *purpurifera* form of *emiliaria* Guen.; termen of forewing slightly more oblique, under-surface of forewing with the purple mostly replaced by pink, the subcostal yellow colouring restricted; under-surface of hindwing without discal spot, the yellow generally restricted, a better developed white band intervening before the black border.

## 22. *Hypodoxa multicolor* ab. *circumsepta* ab. nov.

♀. Differs from Warren's type (*Nov. Zool.* vi. p. 17) in having the ground-colour slightly paler, the forewing beyond the postmedian line and nearly the whole of the hindwing suffused with dark purple-brown or red-brown; on the forewing a patch at apex, one on mid-termen and a small one at torus remain of the ground-colour; on the hindwing one at mid-termen and a smaller one at torus, also a part of the patch of raised scales.

Ninay Valley, Central Arfak Mountains, Dutch New Guinea, 3500 ft., November 1908—January 1909 (type); near Oetakwa River, Snow Mountains, Dutch New Guinea, October—December 1910; both in coll. Rothschild,

Probably only a recurrent aberration, as I have seen virtually typical *multi-color* ♂ from the Ninay Valley, but possibly a prevailing race in Dutch New Guinea.

### 23. *Hypodoxa leprosa incarnata* subsp. nov.

♂ ♀. Differs from typical *leprosa* Warr. (*Nor. Zool.* xiv. p. 124) in the ♀ being entirely deprived of green coloration. The paler parts (subbasal and median areas of forewing and parts of the distal area of both wings) are of the same pinkish white shade ("pinkish ochreous" of Warren's description) as the costal half of the median area of the hindwing. The blackish band-like markings proximally to the first line and distally to the second look rather more purple and less heavy than in the type form. Under-surface of forewing rather brighter pink than in the type form, the distal blackish area not quite so broad. The colour of the head and body is similarly changed, the face pinkish above, bright orange below, not crossed, as in *leprosa leprosa*, by a blackish bar.

The ♂ differs much less from the type form, preserving a general green tone though much more mixed with pink; face with traces of a **rufous** bar in the position occupied by the blackish bar of the type form; the dark markings heavier than in the ♂ *leprosa leprosa*, the pale patch in the hindwing of ♀ *leprosa leprosa* also suggested.

Mount Goliath, January 1911 (A. S. Meek). Type (♀) and paratypes (1 ♂, 2 ♀ ♀) in coll. Rothschild, the ♀ ♀ quite uniform in appearance.

### 24. *Hypodoxa lichenosa rufomixta* subsp. nov.

♂ ♀. Both sexes more mixed with rufous than in typical *lichenosa* Warr. (*Nor. Zool.* xiv. p. 124). In the ♂ this rufous admixture is most apparent in the median area: longitudinal clouds, on the forewing across the cell-spot and posteriorly to vein M, on the hindwing across cell-spot. In addition all the purple-fuscous marks are intensified and slightly sprinkled with rufous, and there is a more distinct whitish-green line or narrow shade distally to the postmedian. In the median area of the hindwing of the ♀ (which, as in the type form, is broadly hoary) the increase of rufous is very apparent (excepting a narrow hoary band proximally to the raised scales), also in a subbasal band of the forewing, as well as a brightening of the ordinary dark markings. Underside nearly as in the type form, but without yellow admixture at base and abdominal margin of hindwing.

Mount Goliath, February 1911 (A. S. Meek), type (♂) in coll. Rothschild. The ♀ (slightly worn) is from the same locality in January.

### 25. *Hypodoxa ruptilinea* spec. nov.

♀, 55 mm. Head and palpus ochreous, tinged with greenish, face mixed with red-brown and fuscous scales. Antenna ochreous to beyond one-fourth. Thorax above red-brown varied with olive, in front chiefly olive and whitish, ends of tegulae mostly olive; beneath mostly greenish ochreous. Abdomen above red-brown, mixed with white and varied in places with olive; beneath paler. Legs tinged with fuscous, especially inner side of foreleg; foretibia above bright ochreous; all femora strongly haired.

*Forewing* with termen becoming strongly oblique, the wing thus appearing somewhat more elongate and narrower than in the allies; colours very varied,

predominantly red-brown, mixed in places with olive; costal margin broadly olive, black-spotted, narrowing distally; extreme base mostly white; some subbasal whitish blotches between the veins; median area mostly white, speckled with red-brown and with large red-brown discal spot; lines darker red-brown, the first from costa at one-fourth, with bilobed distal projection in cell and single projections behind M and SM<sup>2</sup>; second from costa at five-eighths, strongly oblique outwards to R<sup>3</sup>, then parallel with termen, dentate on the veins, especially R<sup>3</sup>, M<sup>1</sup> and SM<sup>2</sup>; subterminal line thick, white, dentate, bent basewards behind R<sup>1</sup>, almost interrupted on R<sup>3</sup>, which is here olive-shaded, behind this vein again as near termen as at R<sup>1</sup>, then slightly incurved behind M<sup>2</sup>; a black blotch proximally to the subterminal between R<sup>3</sup> and M<sup>2</sup>, an olive one distally between the radials; terminal line thick, black, strongly interrupted at veins; fringe grey, bisected by a thick blackish line.—*Hindwing* with the principal tuft of raised scales long, even-margined, white at its base, tips reaching to end of cell, under them some blackish shading; a postmedian dark line starting from costa opposite subterminal of forewing, lunulate-dentate to R<sup>1</sup>, straight to R<sup>3</sup> in middle of wing, there bent distad and slightly interrupted, then again straight, slightly curved distad at abdominal margin; a thick white line accompanies this line distally, and beyond it there is some black shading, especially in abdominal half of wing; subterminal line strongly zigzag at first and rather ill-defined, from R<sup>1</sup> white and formed nearly as on forewing; terminal line less interrupted than on forewing; fringe as that of forewing.

Under-surface whitish suffused with grey; both wings with very broad black band in distal half, shading off somewhat lighter to the termen itself; base of both wings suffused with ochreous yellow, extending irregularly along the veins; forewing with large oval black cell-spot, hindwing with discocellulars weakly marked with grey, somewhat as in *muscosaria* Guen.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type in coll. Rothschild.

Readily distinguished by the shape of the postmedian and good development of the subterminal line, the long and regular hair-scales of the hindwing and other characters, as well as by the shape. Third joint of palpus rather shorter than in most of the species. In the forewing SC<sup>1</sup> is connected with C by a moderate, oblique bar, and R<sup>2</sup> arises from near R<sup>1</sup>. The broad black border of forewing beneath shows no trace of the white spots which are conspicuous in most of the species; the comparative dulness of the underside recalls *muscosaria* almost as much as the *emiliaria* group; *viridicoma* Warr. (*Nov. Zool.* vi. p. 18), from the Solomons, is near it in the postmedian line, etc., but of a quite different colour, with *emiliaria*-like underside, longer third joint of palpus, and longer hindwing.

## 26. *Aeolochroma intima* spec. nov.

♂, 50 mm.; ♀, 54–58 mm. Structure, shape and general facies of the *albifusaria-turneri* group, the typical section of *Aeolochroma*. Face in upper half yellow-green, narrowly red-brown above; in lower half red-brown, very narrowly whitish green below. Palpus red-brown, paler beneath. Head green, slightly mixed with whitish and with red-brown. Antennal shaft red-brown, fascicles of cilia in ♂ about as long as its diameter. Thorax green, patagia red-brown, slightly variegated with whitish and sometimes with green. Abdomen above varied red-

brown and green, usually with some purple-fuscous spots; crests green. Under-side of body and legs paler, more ochreous, foreleg and (more slightly) middle-leg marked with red-brown.

Wings green, in ♂ moderately, in ♀ very strongly blotched with purple-fuscous. — *Forewing* with costal edge mostly purple-fuscous, interrupted with pale green or whitish at origin of all three lines and from the subterminal almost to apex; lines pale green or whitish, often interrupted in parts by the dark blotching, or indistinct in parts through being scarcely differentiated from the ground-colour; antemedian from about one-fourth costa, angled on C, strongly (rather longer than in *turneri*, *prasina*, etc.) oblique distad half-way to cell-spot, then falling nearly perpendicularly on posterior margin, rather evenly dentate; postmedian nearly as in *prasina*, but rather more strongly dentate still, and more nearly perpendicular in its posterior course, the enclosed central area rather broader, especially posteriorly; subterminal forming a white or whitish V close to costa, scarcely traceable beyond; the purple-fuscous clouding consists of: a basal patch, projecting posteriorly to cell; an interrupted narrow band (at least between M and SM<sup>2</sup>) proximally to first line; a line, bar or band distally to first line, occasionally complete, usually interrupted in anterior part of cell; a line proximally to postmedian, occasionally interrupted near costa, always filled up with a proximal blotch between R<sup>1</sup> and M<sup>1</sup>, and usually (in varying intensity) one between M<sup>2</sup> and posterior margin; a cell-mark (in ♀ large; a small costal patch anteriorly to the subterminal; a thick curved line or band from posterior margin close to tornus, touching the postmedian at M<sup>1</sup>—R<sup>2</sup>, joining an irregular patch which runs between the radials (in ♀ sometimes continued to SC<sup>5</sup>); in ♀ almost the entire area between this curved band and the termen is filled up with the purple-fuscous colour, leaving only a small green terminal spot between R<sup>3</sup> and M<sup>1</sup>; a thick terminal line and more or less strong blotches in fringe. — *Hindwing* with white or pale dentate postmedian line, purple-fuscous-margined proximally; purple-fuscous shading costally; purple-fuscous blotches proximally to the vague subterminal, placed at costa, between radials, and between M<sup>2</sup> and abdominal margin; in ♀ almost the entire basal area as far as postmedian line purple-fuscous and the subterminal blotches much extended, connected but leaving at least a green spot between R<sup>3</sup> and M<sup>1</sup>, as on forewing; cell-spot present, rather obscured in the ♀ by the dark surroundings.

Underside of both wings pale ochreous to beyond one-half, bounded by a thick red line, which is slightly or moderately outbent in middle on the forewing and always outangled on or just behind M<sup>1</sup> on the hindwing; followed narrowly and interruptedly on forewing, broadly on hindwing, by a white band; distal area mostly reddish, duller terminally, enclosing a pale spot at apex and a white one between R<sup>3</sup> and M<sup>1</sup>; cell-spots smaller than above, that of forewing followed as far as the red line by an ill-defined whitish patch.

Mount Goliath, January—February 1911 (A. S. Meek) 2 ♂♂, 3 ♀♀ in coll. Rothschild, the type (♂) February.

Very near to—perhaps a race of—*albifusaria* Walk. (*List Lep. Brit. Mus.* xxxv. p. 1589), which I cannot compare side by side. As in that species there is a reddish spot at tornus of forewing; usually also (especially in the ♂) there is some whitish shading beyond the discal spot of the forewing above as well as beneath. The variable purple-fuscous blotching of the central area of the forewing often absorbs it almost entirely from posterior margin to M<sup>1</sup>, and in one ♂ joins the proximal dark band behind cell, here obliterating the antemedian line.

27. *Aeolochroma bakeri* spec. nov.

♂, 34 mm. Face fuscous with a broad white bar across forehead (containing a small fuscous mark at upper edge) and a narrow one at lower extremity. Palpus fuscous above and on outer side, pale ochreous beneath. Vertex greenish ochreous. Antenna shortly and evenly ciliated (the cilia not disposed in fascicles as in the typical species). Thorax green; patagia very variegated, roughly in bands of green, white, black, red, and again at the tips white. Abdomen ochreous tinged with green.

*Forewing* with termen slightly more crenulate than in *prasina* Warr. (*Nov. Zool.* iii. p. 282), more definitely bent at  $R^3$ ; coloration somewhat as in *prasina*, the dark shades deeper and richer; basal patch broken and ill-defined, bright ochreous mixed with reddish and black, the strongest projection behind cell; median area even broader costally than in *prasina*, the two starting from enlarged black costal spots; anteriorly this area is of the ground-colour, the dark shade being confined to the posterior half and some projections anteriorly beside the lines; proximal dark shade of the subterminal interrupted, but strongly diffused proximally in posterior half of wing, nearly meeting the second line; the pale patch from second line to termen between  $R^3$  and  $M^1$  (indicated in many of the genus) extremely conspicuous; terminal dark line thick.—*Hindwing* as far as the postmedian (which is scarcely dentate) strongly shaded with the dark colour, but with a quadrate whitish mark behind the cell-spot, much as in *amethystina*; pale subterminal broad, well developed from  $R^2$  almost to inner margin, its dark proximal shading strong.

Underside similar to that of *intima*, the ochreous parts coarsely though sparsely speckled with fuscous, the forewing less variegated, without definite red line, hindwing with the line less red (more fuscous), thicker, roundly bent, not angled, a large dark discal spot present, distal area more fuscous.

Dinawa, British New Guinea, 4000 ft., August 1902 (A. E. Pratt). Type in coll. Bethune-Baker.

28. *Aeolochroma amethystina* (Warr.).

Of this species Warren (*Nov. Zool.* xiv. p. 123) knew the ♂ only, described from Biagi. I have recently seen 3 ♂♂, 2 ♀♀ from Mount Goliath, January—February 1911. The ♂ possibly shows indications of belonging to a different race from Warren's, the green colour above being rather more restricted, the hindwing beneath paler, especially the subterminal and terminal bands, but the differences are so very slight that I abstain from imposing a subspecific name. The ♂ antenna of this species is only very minutely ciliated, without the fascicles of the typical group; termen of both wings slightly more markedly crenulate.

♀. 62 mm. Larger than the ♂, of a paler, more reddish purple, the darker shading distally to the first line and proximally to the second scarcely appreciable; the lines themselves broader, especially at the margins; the white discal spots greenish, that of forewing joined with a broad irregular green patch from costa; green shading between costa and  $SC'$  anteriorly to this patch; a green costal patch from apex to subterminal; a small green terminal spot between  $R^3$  and  $M^1$ . Hindwing also with cell-spot indistinct and green, a very small green terminal spot between  $R^3$  and  $M^2$ . Underside with the red parts much less bright, forewing with the white apical patch obsolete, the discal spot and green costal patch adjoining it nearly as above, some strong black subterminal and terminal markings. Hindwing with similar black markings, in one example weaker.

29. *Metallophya arenaria* (Leech).

Leech's very faded type, a ♀ from Kinkiang (*Tr. Ent. Soc. London*, 1889, p. 144) has long remained unique. Recently, however, the British Museum has acquired a beautiful ♂ from Maymyo, Burma, April 1912 (F. M. Mackwood), which must be a form of this species, although the first line of forewing falls almost vertically on hindmargin, while in Leech's type it is here markedly oblique inwards. Otherwise the differences are only such as are explainable by the condition. Lines on forewing and at costal margin of forewing blackish, the whole hindwing strongly sprinkled with dark purple; the markings on the underside, though identical, show up more strongly in dark purple, especially an interrupted distal band. The face, front of thorax and base of forewing look brighter (redder). The ♂ characters are not typical; antenna with short stout pectinations, about as long as diameter of shaft; hindtibia dilated, with hair-pencil.

*Crypsiphona* Meyr.

The larva, of which I failed to find any account (see *Gen. Ins.* 129 p. 44), is described (without a name) by Brittlebank (*Vict. Nat.* v. p. 116), and is figured and described by Anderson (*ibid.* ix. p. 89). It seems to be related to that of *Terpna* (*Hypobapta*) *percomptaria* Guen., which I strongly suspect—in spite of the paucity of good imaginal characters—is entirely distinct generically from the Indian *Terpna*.

30. *Oenochlora imperialis majestica* subsp. nov.

Differs from the typical (Australian) form in several particulars, although none are very momentous.

Purple-fuscous dusting stronger and coarser, especially in proximal area.—*Forewing* with costal part of antemedian line strong, postmedian not parallel with termen, but more nearly with antemedian, its costal one-fourth obsolete.—*Hindwing* with salmon-coloured and rose-coloured costal clouding brighter, median line thick, mixed with rosy, expanding between R<sup>1</sup> and R<sup>2</sup>. Underside with the purple bands broadened, hindwing without discal mark. All the "whitish ochreous" parts of the Australian form (see Turner's description, *Proc. Linn. Soc. N.S. Wales* xxxv. p. 644) are here deep, bright ochreous.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek); a few ♂♂ in coll. Rothschild, quite uniform.

31. *Agathia defecta* spec. nov.

♀, 48 mm. Face, palpus, and antenna pinkish brown, lower part of face and underside of palpus and of clavola almost white. Vertex pinkish brown, occiput green. Thorax and abdomen above pinkish brown, base of tegulae green; abdomen with very slender erect crests. Underside of body whitish. Legs whitish, foreleg browner on inner side.

Wings shaped about as in *pisina* Butl. ♀, or with the termen of forewing slightly more convex—a little recalling that of *Allocopage cinerea* Warr.; venation normal. Predominantly pinkish brown, costal margin of forewing rather paler, the bright yellow-green ground-colour reduced to the following patches:

*Forewing*: a broad subbasal band, immediately following the usual basal brown patch (which is here slightly larger and more convex-margined than in



most of the genus), 5 mm. wide in cell, 2 mm. anteriorly (and not quite reaching costa), about 4 mm. posteriorly; an oval subterminal patch between  $SC^5$  and  $R^2$ , its longitudinal measurement somewhat exceeding the transverse; a very small spot anteriorly and another posteriorly to this patch.—*Hindwing*: a rather more extended subbasal patch, reaching the costal margin and nearly reaching base and abdominal margin, its distal edge projecting costally, behind  $R^2$  and behind  $M^2$ ; a narrow subterminal patch from  $R^1$  to just behind  $R^2$ ; a very small spot anteriorly to this patch; a speck on submedian fold about midway between subbasal patch and termen. Both wings with a pale line at base of fringe. The usual dark red terminal markings on either side of the tail of hindwing discernible but not at all conspicuous.

Under-surface dirty white-yellow with a faint tinge of green, forewing with a pink suffusion posteriorly to cell, reaching from  $SC$  to submedian fold, a broad, irregular, deeper pink band beyond it from costa to tornus, a round grey apical spot and lighter grey terminal suffusion; hindwing with an equally broad postmedian pink band and some extremely narrow grey terminal shading.

Mount Goliath, March 1911 (A. S. Meek). Type in coll. Rothschild.

I know no *Agathia* species with which to compare this; the strong restriction of the green coloration a little recalls *Allocopage cinerea* Warr.

### 32. *Agathia laetata* (F.).

I referred here (*Gen. Ins.* 129, p. 58), but doubtfully on account of the reputed locality, the *Phalaena zonaria* of Donovan's *Insects of China*, suggesting at the same time as a possible alternative that the last-named might be a remarkable *laetata*-like aberration of *carissima* Butl. I find that Pryer (*Trans. As. Soc. Japan* xii. p. 59) thinks *zonaria* = *carissima*, but probably he was only acquainted with the single Japanese species of the genus (*carissima*), so that his opinion does not really add appreciably to the elucidation of the question, especially as nearly all the members of the *laetata* group are so closely related that Hampson (*Faun. Ind. Moths*, iii. p. 487) and Turner (*Proc. Linn. Soc. N.S. Wales*, xxxv. 627) have made a clean sweep of them as synonyms, or at the utmost subspecies.

### *Allocopage* gen. nov.

When I wrote my revision I had seen so little material in the genus *Helicopage* and was so much in the dark regarding *cinerea* Warr. and *relata* Warr. that I did not venture to remove them from *Helicopage*, where they had been provisionally located by Warren, merely indicating the **probability** of a distinct genus. I have since satisfied myself that he was right (*Nor. Zool.* vi. p. 330) in placing them together as sexes of a single species (though he then overlooked his own older name of "*Agathia cinerea*," imposed on the ♀ three years earlier), and that the unique venation is constant. The ♂ retinaculum also, though strong, has not the characteristic form of *Helicopage*. I give the characters of the new genus as follows:

Palpus with second joint reaching a little beyond frons, shortly rough-scaled above and moderately beneath; third joint smooth, in ♂ rather long, in ♀ long. Antennae in ♂ shortly pectinate. Pectus hairy. Femora somewhat hairy. Hind-tibia in ♂ somewhat dilated, with hair-pencil; in both sexes with all spurs. Abdomen not crested. Frenulum in both sexes fully developed. Wing-shape

nearly as in *Helicopage*, but with the termen much more weakly crenulate.—Forewing with cell less than one-half, DC moderately to rather strongly incurved (but less extremely oblique posteriorly than in *Helicopage*),  $SC^{1-2}$  long-stalked, their stalk approaching or anastomosing with C,  $SC^2$  sometimes anastomosing with  $SC^{3-4}$ ,  $R^1$  separate,  $M^1$  separate.—Hindwing with C shortly and closely appressed to cell near base, often with a point of anastomosis, then very strongly diverging, DC incurved, becoming strongly oblique,  $SC^2$  separate,  $R^2$  from well above middle of DC but not extreme,  $M^1$  separate.

Type of the genus: *Alloecopage cinerea* (Warr.) = *Agathia cinerea* Warr. (♀) = *Helicopage relata* Warr. (♂).

In my Key to the Genera, *Alloecopage* can be conveniently placed at the very beginning of Group IV.:

Forewing with  $SC^2$  stalked with  $SC^1$  . . . . . *Alloecopage*.  
Forewing with  $SC^2$  stalked with  $SC^{3-5}$  . . . . . the rest.

### 33. *Aracima serrata* Wileman.

The type is a ♀, not ♂ as given in the description (*Ent.* xlv. p. 271). The frenulum is singularly weak, and unless it is damaged the species can hardly remain in *Aracima*, though all other characters agree.

### *Anisozyga* Prout.

In this rather extensive genus I allowed a few species to remain which ought to have been removed. My sole excuse is that, with such an enormous number of Hemitheine species to examine in a limited time, I ventured to trust some plausible-looking placings in *Anisozyga* (*Anisogamia* Warr., nom. praeocc.) without examining all the characters so carefully as was always done where there seemed more likelihood of error or doubt. Nos. 23, 27, 28, 34, 35, and 36, having glabrous femora and wanting the ♀ frenulum and ♂ hindtibial process, are manifestly out of place in *Anisozyga* and even in Group IV. On No. 28, *batis* Warr., see *Oxychora*, infra. No. 36, *triseriata* Warr., sinks as a synonym to *Prasinocyma nivisparsa* Butl.; *coerulea* Warr. is a *Gelasma*, in so far as that genus differs from *Prasinocyma*, which is little more than a matter of shape; *albiseriata* Warr. must be called a *Prasinocyma*, but is likely related, in its very slender, elongate palpus, etc., to the group of small species (*viridaurea*, etc.) which I have left in *Gelasma*, but which may probably form a new genus; *scintillans* is also a *Prasinocyma*, related to *nivisparsa*; and *seminivea* belongs in the same vicinity.

### 34. *Anisozyga polyleucotes* ab. *adornata* ab. nov.

Together with typical ♂♂ of this species occurred two smaller ♂♂ (36–37 mm.), with the ground-colour purer white (not creamy), the green markings somewhat extended, and in particular with a small rufous subapical patch on the hindwing above, in the position of the blackish one of the underside, but less extended. On the forewing the green markings in the middle of the wing are more confluent about the origin of the median veins, and on the hindwing there is a larger and better defined green blotch between the radials just beyond the cell, while the white discal mark is less conspicuous and appears less raised; on both wings the subterminal green markings are also somewhat better developed. Hindwing

beneath with the apical dark blotch appreciably narrower. Head and thorax above rather more strongly mixed with green.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type and paratype in coll. Rothschild.

Not unlikely a good species, as no intermediates are known, and the ground-colour may be significant. On the other hand, Warren has described (*Nov. Zool.* xix. p. 68) as *absona* ab. *exalbata* a somewhat similar form, but still more creamy than *polyleucotes*, and with more green than *adornata*; and there is just a possibility that one polymorphic species (*absona* Warr.) may prove to cover all the forms.

### 35. *Anisozyga mimicaria* spec. nov.

♂, 28 mm. Related to *absona* Warr. (*Nov. Zool.* iii. p. 287), but considerably smaller, the costal edge of forewing less darkened, all the white markings extended; in particular the large midcostal spot of forewing is continued as a narrow dentate band to posterior margin, the first outer band is broader and uninterrupted, the succeeding band of white marks enlarged. On the other hand, the red-brown subapical spot of hindwing is considerably reduced, both above and beneath, on the upper surface restricted to two very small broken spots, one on each side of SC<sup>2</sup>.

Mimika River, New Guinea, July 1910 (A. F. R. Wollaston). Type in coll. Brit. Mus.

### 36. *Anisozyga stellifera* spec. nov.

♂, 30–36 mm. Head green, somewhat spotted with white. Palpus green, whitish beneath and at tip. Abdomen dorsally green, spotted with white, and with a small blackish spot towards anal end. Pectus, pencil of hairs, and underside of abdomen white. Foretibia and tarsus fuscous spotted with white.

Wings semitransparent green, of the same shade as in the *fascinans* group, to which it evidently belongs. Usually larger than *stellata* Warr. (*Nov. Zool.* xiv. p. 129), markings nearly as in that species, the apical, subapical, and mid-terminal white spots of forewing smaller, the discal spot usually wanting or greatly reduced, only in a single example well developed. No white fillet.

Mount Goliath, January—February 1911 (A. S. Meek). Type and seven other ♂♂ in coll. Rothschild.

Smaller than normal *absona* Warr., more strongly white-dotted on veins, wanting the large discal patch, submarginal bands reduced, subapical spot of hindwing smaller.

### 37. *Anisozyga iridescens* (Warr.).

Warren (*Nov. Zool.* xiii. p. 81) described this species from the ♂ only. A series from Mount Goliath, January—February 1911, includes two ♀♀, which I have no hesitation in referring here, the agreement being complete except in the dark dorsum of abdomen and presence of double dark spot on posterior margin of forewing at about two-fifths, and of dark terminal blotches on both wings. That of the forewing is purplish-fuscous proximally, becoming more whitish distally, is about 1.5 mm. in width anteriorly, its proximal margin curving basewards from R<sup>1</sup> to beyond R<sup>2</sup>, then receding to termen at M<sup>1</sup>, only some very narrow terminal shading remaining purplish-fuscous posteriorly; that of the hindwing is similarly formed, but a little narrower. *A. reducta* Warr. (*Nov. Zool.* xix. p. 70) is possibly hardly more than a local race of *iridescens*; its ♂ scarcely differs except

in the presence of a minute fuscous apical blotch on hindwing, but the ♀ has broader and more complete dark borders. Both have the discocellulars formed as in *Oxychora*, but the ♀ frenulum is fully developed and the characteristic hair-pencil of *Anisozyga* is present beneath (white). The doubtful *innuba* Warr. (*Nov. Zool.* xiv. p. 128) is another close ally, with the borders more reddish.

38. *Anisozyga albifinita* spec. nov.

♂, 34 mm. Face whitish, somewhat mixed with green. Vertex green. Palpus green on outer side, white beneath; third joint elongate. Thorax and abdomen above grey-green, strongly mixed with purple-fuscous; beneath white, the pencil of hairs apparently white (in part damaged). Foretibia and tarsus dark fuscous spotted with white.

Both wings with discocellulars formed somewhat as in *Oxychora*; subdiapophans grey-green, vaguely watered transversely with rather darker grey-green, the veins interruptedly fuscous.—*Forewing* with costal edge purple-fuscous, with a few small whitish dots; first line rather broad, whitish, lunulate, outcurved in submedian area and terminating in a large, distinct white spot on posterior margin; discal spot dark fuscous; postmedian line scarcely traceable except as a conspicuous white spot on posterior margin at about 3 mm. from antemedian; a vague distal bordering of purple-fuscous, its proximal edge about 3 mm. from termen costally, projecting between radials and again behind  $M^2$ , where it reaches the white postmedian spot, only 2 mm. wide between  $R^3$  and  $M^2$ ; a fine dark terminal line, swelling into spots between the veins.—*Hindwing* with rather large dark cell-spot, inner margin somewhat variegated, being mixed with purple-fuscous dusting and some small whitish spots; a vague purple-fuscous border and dark terminal line nearly as on forewing.

Underside paler, almost unmarked; forewing with a small dark cell-spot, both wings with terminal interneural dots.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

39. *Anisozyga albinata taminata* subsp. nov.

♂, 36–38 mm.; ♀, 32–33 mm. Differs from typical *albinata* Warr. (*Nov. Zool.* xiii. 80, as ab. of *flavilinea*) in having the purplish-fuscous cloudings greatly extended, the abdomen dorsally mostly purplish-fuscous, some of the white dorsal spots obliterated, and in having the antemedian line (which, as in *albinata albinata*, is only distinct in the anterior half) white, not yellowish. The fuscous markings normally consist in the forewing of a median band 3–4 mm. in width right across the wing, and some terminal clouding from costa to across  $R^3$ ; on hindwing of a much enlarged apical blotch (reaching across  $R^2$  and almost to the postmedian line) and some narrower shading on abdominal margin. The ♂ type and one ♀ (Oetakwa River) conform absolutely to this description, a second ♀ has the markings very slightly less extended; another ♂ is intermediate towards the type form, having lost the terminal dark markings of the forewing and the abdominal of the hindwing, while the band is narrowed and the apical blotch of the hindwing and the dorsal markings of the abdomen are reduced.

Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000–3000 ft., August 1910 (A. S. Meek), type ♂ and a further ♂ and ♀; near Oetakwa River, up to 3500 ft., October–December 1910 (A. S. Meek), one ♀; all in coll. Rothschild.

Possibly a distinct species, as the ♂ hindtibial process appears longer—nearly as long as first tarsal joint (in *albinata* about half as long). Possibly, again, a form of the following; the group (*speciosa* Luc., etc.) is very difficult.

40. *Anisozyga dorsimaculata* spec. nov.

♂, 34–38 mm. Similar to *flavilinea* Warr. (*Nov. Zool.* xiii. p. 80), differing as follows: Brighter, more yellowish green; palpus and antenna (especially clavola) brighter, lighter reddish brown (less fuscous); occiput entirely green, whereas in *flavilinea* there is a somewhat irregular crescentic white mark posteriorly and in *albinata* (which I regard as bon. sp.) a white dot; antemedian line extremely slender, usually interrupted, white, not yellowish; postmedian obsolete, except between R<sup>2</sup> and M<sup>1</sup> of forewing and R<sup>3</sup> and M<sup>1</sup> of hindwing, where it is white; subterminal series of spots similarly obsolescent; terminal white dots in anterior half of each wing excessively minute; fuscous discocellular shade of forewing weak, costal edge on the contrary more broadly fuscous; under-surface with the pale markings weaker; abdomen without white spots, but with a very large fuscous blotch (in *flavilinea* and typical *albinata* confined to a single segment, in *dorsimaculata* occupying three); ♂ antennal pectinations rather shorter (little longer than diameter of shaft); ♂ hindtibial process about 1 mm. in length, as long as first joint of tarsus, hair-pencil very strong.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek), type and others; Upper Setekwa River, 2000—3000 ft., August (2), September (2), 1910 (A. S. Meek); Mount Goliath, February 1911 (A. S. Meek); all in coll. Rothschild.

Perhaps still closer to *speciosa* Luc., of which I do not know absolutely authentic males, but which seems to include certain forms with very little white marking. Except the difference in the dorsum of abdomen I can point to no decisive differential character.

41. *Anisozyga albilauta* ab.  
*niviplena* ab. nov.

♂, 35 mm. Differs from the type form (*Anisogamia albilauta* Warr., *Nov. Zool.* iv. p. 33 = *fragmentata* ab. *major* Warr., *ibid.* xix. p. 69) in the considerable extension of the white markings, which gives it a very different aspect. Costal margin of fore- and inner margin of hindwing more broadly white; first line of forewing much thicker, cell-mark not dark-pupilled, postmedian line broader, not interrupted, posterior blotch extended almost to tornus, a white subterminal line connected midterminally with apical and subternal blotches. Hindwing with a thick white cell-mark, thick, uninterrupted postmedian and a subterminal similar to that of forewing.

Near Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000—3000 ft., September 1910 (A. S. Meek). Type in coll. Rothschild.

The type specimen of *albilauta* Warr. is in very worn condition, but a careful comparison with that of *major* Warr. (bon. sp.) leaves no doubt of their identity.

42. *Anisozyga isogamia* spec. nov.

♂, 28–29 mm.; ♀, 34 mm. Very like *fragmentata* Warr. (*Nov. Zool.* xiv. p. 127), but with the sexes nearly alike; somewhat more translucent (colour of *iridescens* Warr.), the veins strongly dotted with white; costal edge more narrowly

white, much more strongly dark-speckled, the speckling olive-brown rather than dark fuscous; discal spot of forewing reduced, less distinctly ocellated, the two subapical costal spots farther apart, the proximal reduced, the distal nearer apex and increased to a strongly dentate thick line, reaching to  $R^1$  or nearly to  $R^2$ . In the ♂ the white thoracic blotch encloses less, and less definite, dark marking, but its posterior part is more extended transversely; in the ♀ the dorsum of abdomen is mainly dark fuscous. The ♂, as in *fragmentata*, has the abdominal margin of the hindwing whitish; in the ♀ it remains green. In *fragmentata* the venation is normal, DC of forewing a rather deep but regular curve, of hindwing curved, becoming oblique, with  $R^3-M^1$  well stalked; in *isogamia* it is as in the *iridescens* group and in *Oxychora*,  $DC^3$  acutely inangled, hindwing with  $M^1$  varying from connate to short-stalked. The pencil beneath base of forewing is white, as in *fragmentata*.

Mount Goliath, January—February 1911 (A. S. Meek), 3 ♂♂ and 1 ♀ in coll. Rothschild.

#### 43. *Anisozyga orbimaculata magnificata* subsp. nov.

♂, 35–36 mm. Larger than typical *orbimaculata* Warr. (*Nov. Zool.* xiv. 129) from Biagi, the deeply lunulate-dentate proximal white line not or scarcely interrupted, the white distal markings less grey-dusted, enlarged, especially the "bracket-shaped" marks of the antepenultimate series between  $R^3$  and  $M^2$ , which form distinct, broad, confluent patches; a white discal dot is present on the forewing; the apical blotch of the hindwing is darker than in Warren's type and less regularly rounded: uniform purple-fuscous, or at lightest dull rufous internally instead of whitish pink, and with a broader and darker purple-fuscous circumscription; but I gather from the description that this spot varies in colour in the Biagi form. Abdomen with a rather large purple-fuscous blotch on fifth abdominal, which is only indicated by a few dark scales in the type form; the white dorsal dots well developed.

Mount Goliath, January—February 1911 (A. S. Meek), 7 ♂♂ in coll. Rothschild, showing no variation except in colour of apical blotch of hindwing.

#### 44. *Anisozyga decorata goliathensis* subsp. nov.

♂. Only different in a few not very striking, but apparently constant characters from *decorata decorata* from the Angabunga River (*Nov. Zool.* xiii. p. 79). Costal spot at origin of antemedian line scarcely wider than the line itself; tornal blotch of forewing smaller, reduced on the underside to a few fuscous scales; subapical blotch of hindwing less elongate, leaving a patch of the ground-colour from the tooth at the end of  $R^1$  almost to the apex, whereas in *decorata decorata* it extends right to the tooth at end of  $R^1$ .

Mount Goliath, January—February 1911 (A. S. Meek), 5 ♂♂ in coll. Rothschild.

Rather brighter green than *desolata* Warr. (*Nov. Zool.* xiv. p. 126), which has no tornal blotch to forewing, a larger discal mark, whiter postmedian line, larger and rather brighter subapical blotch to hindwing, etc.

#### 45. *Anisozyga bifuscata* spec. nov.

♂, 32–36 mm. Head and face green. Palpus fuscous, its underside and the extremities of second and third joints white. Thorax green above, white beneath,

the pencil of hair pale green. Foretibia and tarsus fuscous spotted with white. Abdomen dorsally green, with a white spot at base, then one or two small white dots, then two or three sometimes partly confluent fuscous blotches.

Wings green, shaped and coloured about as in the preceding.—*Forewing* with costal margin purplish-fuscous, spotted with whitish; a reddish spot at base; first line reddish, somewhat white-mixed, strongly zigzag, from costa at about 4 mm., M-shaped outwards in cell, strongly angled on vein M, making a bold outward sweep in submedian area, but with a slight indentation at its extremity on the fold, finally bending outwards again from SM<sup>2</sup> to posterior margin; a similarly coloured, indistinct, elongate cell-mark; postmedian line apparently also zigzag, but very ill-defined, chiefly showing as spots between the veins; a subapical purple-fuscous blotch; a few subterminal pale spots, only that between R<sup>3</sup> and M<sup>1</sup> prominent (of moderate size and white); distal margin with white dots in the teeth; fringe mostly reddish-fuscous.—*Hindwing* without the costal, basal and antemedian markings; subapical fuscous blotch larger than on forewing.

Under-surface whitish green, costal margin of forewing somewhat ochreous, spotted with fuscous; forewing with a fuscous discal dot, both wings with deep fuscous subapical blotch and some terminal fuscous dots between the veins, at least in anterior half.

Mount Goliath, January—February 1911 (A. S. Meek), 7 ♂♂ in coll. Rothschild.

Nearly related to *decorata* Warr., but at once distinguishable by the strong fuscous subapical blotch of forewing both above and beneath. R<sup>3</sup>-M<sup>1</sup> of hindwing are rather shortly to moderately stalked; in the only two *decorata* which I have before me they are scarcely stalked--virtually connate.

#### 46. *Anisozyga eranna* spec. nov.

♂, 34-35 mm. Face and vertex bright green, the face narrowly edged with white beneath, the occiput with some reddish spots. Palpus ochreous reddish, narrowly white beneath. Antenna ochreous reddish, spotted with brick-red; pectinations short. Legs ochreous reddish above, white beneath; foretibia and tarsus darker, spotted with whitish. Thorax above green, with small reddish patch in middle; beneath whitish, the pencil of hairs green somewhat mixed with white. Abdomen above green with some whitish mediodorsal spots and a reddish belt about the fifth and sixth segments, and reddish extremity.

Wings bright green, costal edge of forewing and fringes of both wings ochreous-reddish mottled with light brick-red.—*Forewing* with a white dot at base; antemedian line white, edged with reddish, starting from a thickened costal spot at 3 mm., indented on cell-fold and more slightly on M, somewhat excurved, running into a red blotch on hindmargin at nearly 4 mm.; discal spot large, white, crescentic; postmedian line arising from a large white reddish-edged costal mark 5 mm. before apex, but largely obsolete, being only represented by a few dots and by a fine lunule between R<sup>3</sup> and M<sup>1</sup>; midway between postmedian and termen a series of white, not reddish-edged, spots between the veins, only that between R<sup>3</sup> and M<sup>1</sup> large; distinct ochreous whitish dots in the teeth at the vein-ends.—*Hindwing* with cell-mark smaller, first line obsolete, a large apical reddish blotch, darker in its centre; the rest as on forewing.

Underside whitish green, the costal edge of forewing and the fringes nearly as above, the markings of the upper surface mostly faintly reproduced; forewing

with a narrow bright green costal mark proximally to the postmedian pale blotch and a broader one distally to it, the latter containing the first two white spots of subterminal series ; hindwing with the centre of apical blotch fuscous.

Mount Goliath, January—February 1911 (A. S. Meek). Type and two others in coll. Rothschild.

The blotches on the upperside are coloured nearest as in *veniplaga* Warr. (*Nov. Zool.* xiv. p. 130). From *desolata* Warr. (*ibid.* p. 126) *eranna* can be distinguished at once by its brighter colour, much lighter and differently shaped reddish blotch, white spot between  $R^3$  and  $M^1$  on both wings, green not brown costal mark near apex of forewing beneath, etc.

#### 47. *Anisozyga beatrix* spec. nov.

♂, 40–43 mm. Face green. Vertex whitish ochreous. Palpus with third joint elongate ; ochreous, paler beneath and at tip. Thorax and abdomen above mostly green, thorax posteriorly and abdomen at base occupied by a large, somewhat shield-shaped, pale fleshy, darker-edged blotch, abdomen afterwards with some dorsal dots of the same colour and a large posterior blotch. Pencil of hair at base of forewing beneath green.

Wings green with some ill-defined whitish dots and strigulae.—*Forewing* with costal margin strongly ochreous ; a moderate whitish-fleshy subapical blotch, connected with apex by a costal streak ; a very small subterminal mark of the same colour on posterior margin ; a very weak, slender, sinuous antemedian line and indications of small cell-mark ; termen subcrenulate, with white dots at vein-ends.—*Hindwing* with a moderately large apical blotch of the same colour as that of forewing, dark-edged and containing a few small fuscous dots and two large dots on termen, between C and  $SC^2$  and between  $SC^2$  and  $R^1$  ; termen strongly crenulate, with white dots at the vein-ends.

Underside whitish green, both wings with the apical blotch present, that of forewing fuscous in its middle, that of hindwing all fuscous except the extreme edges.

Mount Goliath, January—February 1911 (A. S. Meek), 5 ♂♂ in coll. Rothschild.

Related to *sexmaculata* Warr. (*Nov. Zool.* xiv. p. 134), the blotches exactly the same colour, but smaller, less numerous, costal margin of forewing more ochreous, dorsum of abdomen also different.

#### 48. *Anisozyga delectabilis* spec. nov.

♂, 38–41 mm. Face green, narrowly white below. Palpus ferruginous above, overlaid with black at least in the basal part of second and third joints, these joints whitish at tips ; all whitish beneath. Head green, slightly mixed with ferruginous. Antenna pale ochreous spotted with ferruginous. Thorax above green, narrowly variegated with ferruginous and blackish in middle ; metathorax with a bright ferruginous tuft. Abdomen above mostly green, with white dorsal spots, segments 2 and 3 narrowly belted with ferruginous and black scaling at end, segments 4–6 more largely mixed with these colours dorsally. Pectus whitish, pencil of long hair green. Legs whitish, forefemur and tibia above and tibia on innerside fuscous, foretarsus fuscous above, with ends of joints white ; hindtibia with terminal process quite short.

Wing-shape and venation normal. Rather dark but semitransparent green.



—*Forewing* with costa ochreous mixed with ferruginous and spotted with fuscous; an irregular pale line at base; some fine white subbasal markings, tending to form one or two irregular transverse lines; antemedian line slender, white, lunulate-dentate, the teeth pointing proximad on the veins, the course oblique outwards to submedian fold, then incurved to  $SM^2$  and again oblique outwards to rather before middle of hindmargin, here accompanied proximally by a flattened, red, black-mixed blotch, slightly variable in extent, but never crossing far beyond  $SM^2$ ; a crescentic white cell-mark; postmedian line white, somewhat zigzag, lunulate-dentate, the teeth pointing distad on the veins; thickened and produced at  $R^1$ , exceedingly fine from  $R^1$  to beyond  $R^2$ , a little thickened at  $R^3$ ; also thick costally, where it forms a white proximal margin to a ferruginous and reddish subapical blotch which contains distally two black, distally white-edged spots; a small, flat, ferruginous, black-marked blotch on posterior margin from postmedian line to tornus; a small white triangle in or close to apex; a smaller, rounder white dot behind it, between  $SC^3$  and  $R^1$ , a series of minute interneural ones (mostly in pairs) continuing these subterminally; terminal whitish triangular dots at vein-ends; fringe pale with a broad, interrupted, reddish-fuscous line intersecting it before middle and a greyer one distally.—*Hindwing* without first line, white cell-mark or inner-marginal blotches, the rest nearly as on forewing; a white spot (sometimes minute) at the base of  $M^2$ ; the subapical blotch of forewing here becomes apical, and is extended nearly to  $R^2$ , is more black-dusted and contains two or three rather large black spots.

Under-surface much paler green, the white markings of upperside present but feeble, the apical blotches of both wings present, uniformly blackish.

Mount Goliath, January—February 1911 (A. S. Meek). Type in coll. Rothschild; 9 other ♂♂ in coll. Rothschild and Brit. Mus.

Possibly a local race of *gracililinea* Warr. (*Nov. Zool.* xiv. p. 127), from which it scarcely differs except that the postmedian line of both wings is dentate on all the veins, whereas in that species it makes a single bold curve from before  $R^3$  to behind  $M^2$ , and that on the forewing the line is more faint about  $R^1$  and  $R^2$ . From *decorata* Warr., which it also resembles, it can be distinguished by the deeper, bluer green colour, clearer white lines, larger blotch on posterior margin proximally to the first line of forewing, larger subapical blotch on forewing beneath, etc.

♀. A ♀ which I think, on account of the tufted metathorax, position and course of antemedian line, thin, curved discal mark, approximation of lines on posterior margin, separated subapical spots of forewing, white colour at apex, etc., may be referable to this species, should be described here. 36 mm. Face green, thorax partly green, vertex, middle of thorax, metathoracic tuft and abdomen mixed with white and deep flesh-colour.—*Forewing* with base and costa broadly the same, the narrow, curved discal mark confluent therewith; first line white, rather thick, wavy, rather oblique outwards from costal margin to submedian fold, here roundly bent and thence slightly incurved; accompanied proximally in posterior half of wing by a rather large, deep flesh-coloured blotch; postmedian line white, from nearly two-thirds costa, about parallel with termen to  $R^3$ , then strongly out-bent, forming a strong rounded prominence, incurved again to and along  $M^2$ , approaching first line, the enclosed green space from here to posterior margin being only about 1 mm. broad; a narrow pale fleshy band follows the postmedian, then three ovate green spots between  $SC^1$  and  $R^2$ , separated by pale veins, succeeded

distally by a thick deep flesh-coloured line ; a further narrow white band, a thick deep flesh-coloured line (arising from green subapical spot), and finally a white band, broadest in anterior half of wing ; terminal line thick, green, interrupted with white at the vein-ends ; fringe with alternately white and fleshy lines, but more spotted with fleshy opposite the veins.—*Hindwing* green as far as the postmedian line, merely with a small, fine white cell-mark ; postmedian line and distally nearly as on forewing, no green costal markings, the white terminal band much less clear. Underside paler, the markings more shadowy, but with an almost complete fuscous subterminal band on the forewing (occupying the position of the two outer fleshy lines and their interspace), only obsolete from costal margin to  $SC^4$  and containing a pale spot between  $SC^4$  and  $SC^5$  ; hindwing with a similar band from costa to  $R^3$ , broad anteriorly, narrowing, a very feeble and slender outcurved continuation from  $R^3$  to  $M^2$ .

Mount Goliath, February 1911 (A. S. Meek), in coll. Rothschild.

#### 49. *Anisozyga longidentata* spec. nov.

♂, 29 mm. Face green, white below. Palpus green, third joint not very long, white. Vertex green mixed with white. Antenna white spotted with red-brown ; pectinations short. Thorax mostly green, the pencil beneath wanting. Abdomen dorsally green with white spots. Foretibia and tarsus fuscous spotted with pure white.

*Forewing* with termen moderately crenulate ; green, rather more yellowish than in most of the genus, irregularly spotted and streaked with white, especially in basal area ; costal edge narrowly deep chocolate, spotted with white ; lines white ; antemedian thick, from costal margin at almost one-third to posterior margin at one-half, strongly outbent on entering cell, thence lunulate-dentate ; postmedian at about 3.5 mm. from termen, deeply dentate, the distal teeth placed on the veins, the proximal filled in at their tips with white spots and giving place to thickened lunules posteriorly ; a chain of elongate interneural white spots shortly beyond the postmedian, more closely approximated to it in the posterior than in the anterior half of the wing ; a series of similar but smaller ones close to termen ; termen with white dots at vein-ends ; fringe green, filled in with white in the interneural crenulations.—*Hindwing* with termen strongly crenulate ; mostly white, marked with green in inner-marginal region, with green cell-spot and very deeply dentate green lines beyond ; the first with the points of all the distal teeth approximately equidistant from termen, but that on  $R^2$  much the longest, on account of extremely deep indentations of the line on either side of it ; the second similar, its deepest indentation between  $R^2$  and  $R^3$ , its distal teeth running along the veins to near termen ; the third (subterminal) consisting of narrow interneural V-shaped marks pointing proximally, their apices slightly filled in with green, their distal extremities in part touching a green terminal line ; fringe as on forewing.

Underside much more yellowish ; the costal edge of forewing deeper ochreous, both wings with two ill-defined, thick, approximated whitish postmedian lines, the proximal the more dentate.

Mount Goliath, January—February 1911, 3 ♂♂ in coll. Rothschild.

A very distinct species. The discocellulars are formed almost as in *Oxychora*, but the frenulum, the hairy femora, etc., indicate a true, if slightly aberrant, *Anisozyga*.

50. *Anisozyga lenis* spec. nov.

♂, 34 mm. Very closely related to *sublaturata* Warr. (*Nov. Zool.* vi. p. 327) but smaller; otherwise the differences noticeable on the upper surface are slight. Ground-colour slightly more greenish, the green markings a little less deep, hence the contrast decidedly toned down; distal edge of median band of forewing and the corresponding edge of green basal half of hindwing less deeply scalloped out between  $R^2$  and  $R^3$  and between  $M^2$  and  $SM^2$ ; on hindwing also this green area is rather more extended, and there is a small, only slightly broken reddish subapical blotch in place of the "blackish" (purple-fuscous) dots of *sublaturata*. Underside without the olive basal suffusion, the thick olive-fuscous postmedian line which bounds it (or which remains even when, as in some *sublaturata* from the Oetakwa River, the suffusion is nearly obsolete) reduced to a dentate line from C to  $R^3$ ; the olive-fuscous submarginal band very much narrowed, even somewhat interrupted, widening merely at costal extremity, especially on hindwing, and emitting no blotches proximally between  $R^2$  and  $R^3$ .

Dinawa, British New Guinea, 4000 feet, August 1902 (A. E. Pratt). Type in coll. Bethune-Baker.

That this is not a local race of *sublaturata* is proved—apart from the almost too great differences in the position of the markings—by the occurrence of typical *sublaturata* at the same time and place.

51. *Metacineta vernicoma* spec. nov.

♀, 30 mm. Structure and general coloration entirely agreeing with the other species of the genus, hindwing not noticeably bent at  $R^3$ , abdominal crests very small, red, on a rather broad red mediodorsal stripe, wings less strigulated with whitish.

*Forewing* with costal edge whitish yellow, not white, not dusted with red except at extreme base; discal dot small, red; no other red spots; no white spots at vein-ends, a fine, interrupted red line at base of fringe, followed in fringe by red spots opposite the veins. *Hindwing* with similar discal dot and bordering.

Under-surface paler, without discal dots; no red line at base of fringe, no red dusting at base of costa of forewing.

Southern Nigeria, January 1909 (G. C. Dudgeon). Type in coll. Brit. Mus. An extremely worn ♀ from the Oban district, Southern Nigeria (P. A. Talbot), also probably belongs here.

In the fore- as well as in the hindwing  $R^2$  arises quite near  $R^1$ .

52. *Comibaena castaneata* (Warr.).

*Comostolotes castaneata* Warr., *Nov. Zool.* xiii. p. 87 (1906).

*Probolosceles agathia* Warr., *ibid.* xix. p. 80 (1912).

*Pyrrochoris castaneata* Prout, *Gen. Ins.* 129. p. 239 (1912).

I find that this very distinct little species possesses a frenulum—slender and colourless, but not extremely short. It is probably a very specialised development of *Comibaena*, with the five subcostals and  $R^1$  all stalked together and the ♂ hindtibial process wanting. The wing-shape and pattern give some suggestion of the *pictipennis* group of that genus.

53. *Comibaena rhodonia* spec. nov.

♀, 22 mm. Face and palpus white marked with green; palpus with second and third joints very long. Vertex green. Antenna simple, whitish. Thorax green above, in front white spotted with red; abdomen with some white, red-edged spots (partly discoloured), anal extremity white.

*Forewing* with  $SC^1$  from cell, anastomosing with C,  $SC^2$  arising before  $SC^5$ ; light apple-green, costal margin spotted with red, the red becoming predominant distally, expanding at two-thirds and again at apex, enclosing white spots at the expansions; an ill-defined red, white-dotted spot on posterior margin before one-half, a few red scales on M before origin of  $M^2$ ; cell-dot black; a series of postmedian red blotches, enclosing white dots or dashes on the veins; first blotch small, on  $R^1$ ; second large, from  $R^2$  to across  $R^3$  and followed by some red dusting along  $R^3$  to termen; third blotch small, on  $M^1$ ; fourth large, from tornus and posterior margin to across  $M^2$ ; termen with small, white-centred red spots at vein-ends; fringe pale green, marked with red opposite the veins.—*Hindwing* with termen rounded,  $M^1$  stalked; concolorous with forewing, with small black cell-dot and series of terminal red, white-centred spots, that at tornus larger.

Underside pale green, costal margin of forewing tinged with reddish, both wings with weak cell-dot.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

Nearly related to *inductaria* Guen. and *viridifimbria* Warr.; distinguished by the large rosy blotches: not impossibly an aberration of the latter.

54. *Racheospila nortia* (Druce).

*Synchlora*(?) *nortia* Druce, *Biol. Centr. Amer. Lep. Het.* ii. p. 93; Prout, *Gen. Ins.* 129 p. 115.

I was unacquainted with this species when my Revision appeared, and merely cited it in the position assigned by Druce. I have now seen examples from Costa Rica collected by Mr. Schaus, and find that it belongs to the *diarita*-group of *Racheospila*, i.e. *Lissochlora* Warr., as already suggested with a query by Warren (*Nov. Zool.* vii. p. 135). A much larger form—or very close ally which I have not yet been able to differentiate—occurs in S.E. Peru.

55. *Racheospila superaddita* spec. nov.

♂, 18 mm. Face red, with two white spots below. Palpus red above, beneath and at end of second joint snow-white. Vertex and antennal shaft snow-white; occiput red. Thorax and base of abdomen above green; abdomen with four raised white dorsal spots standing on a dark red ground, those on second and third segments large, confluent, occupying a great part of the segments, that on fourth smaller and detached, that on fifth still smaller. Pectus, abdomen beneath, and legs mostly white; posterior tibia with rather strong pencil and well-developed terminal process one-half as long as tarsus.

*Forewing* apple-green, with costal edge red at base, otherwise snow-white narrowly margined with red; a minute red cell-spot; a fine, indistinct, curved whitish antemedian line from M to posterior margin; a distinct, somewhat lunulate-dentate white postmedian, 2 mm. from and parallel with termen, only slightly incurved posteriorly; terminal line fine, red, nowhere thickened; fringe white, finely and weakly barred with reddish opposite the veins and with the tips reddish.

tinged.—*Hindwing* with termen slightly more prominent about  $R^3$  than in the allies, C not anastomosing with cell; postmedian line removed rather further from termen; terminal line and fringe as on forewing.

Under-surface paler, the red at costal margin of forewing rather broader; cell-dots and line obsolete.

Jimenez, W. Colombia, 1600 ft., July 1907 (dry season). Type in coll. L. B. Prout.

Although this group (Section II., *Gen. Ins.* 129, p. 109) is already rather extensive and the species closely allied, I have seen all except *venustula* Dogn. and *lesteraria* Grossbeck (both of which are shown by the descriptions to be entirely different) and cannot refer the present species to any. Nearest to *sigillaria* Guen. and *ephippiaria* Möschl., the white lines better developed, red on termen and fringe less developed, hindwing less perfectly rounded, ♂ hindtibial process longer.

#### 56. *Progonodes holochroa* spec. nov.

♂, 38 mm. Head and palpus green, a narrow white fillet between antennae. Antennal shaft ochreous whitish. Thorax above green, beneath white. Abdomen above dirty ochreous whitish with a slight admixture of green; crests dark purplish bronze. Legs whitish, tinged (especially the fore and middle pairs) with reddish brown above and on outer side.

Wings shaped about as in *stagonata* Feld. (*Reise Novara, Lep. Het.* t. 127, f. 25).—*Forewing* uniform bluish green, not very densely scaled; costal margin with coarse fuscous speckling which does not quite reach the extreme costal edge; a fuscous discal spot; a series of large white dots at the vein-ends; terminal line fuscous, somewhat interrupted by the extremities of the white dots; fringe ochreous, slightly tinged with fuscous opposite the veins.—*Hindwing* concolorous, with a rather large white discal spot on  $DC^2$  and a very small one posteriorly on  $DC^3$ ; termen and fringe as on forewing.

Underside much paler. Forewing with costal margin broadly fuscous as far as end of cell (the extreme edge quite ochreous), ochreous beyond, with a few coarse fuscous speckles; cell tinged with fuscous; fringe as above. Hindwing with the large white discal spot feebly indicated; fringe as above.

Chiriqui, Panama (received through Staudinger and Bang-Haas). Type in coll. L. B. Prout.

Readily distinguished from its nearest allies (*stagonata* and *arycanda*) by the absence of white admixture in the green ground-colour.

#### 57. *Chlorodrepana cryptochroma* spec. nov.

♂, 32 mm. Face black. Palpus black, base beneath lighter and more reddish. Antenna ochreous. Thorax above green. Abdomen scarcely crested; brown, dorsally spotted and speckled with blackish. Legs ochreous, forelegs fuscous above.

*Forewing* with  $R^1$  not stalked,  $M^1$  barely stalked; uniform deep blue-green, extreme costal edge salmon-colour.—*Hindwing* with  $M^1$  barely stalked; deep blue-green, costal area as far as middle of cell and  $R^2$  (rather less far towards apex) salmon-colour.

Underside ochreous; forewing, with the exception of the margins and an ill-defined apical patch, strongly irrorated with blackish, base of costa and most of submedian area rather more reddish; hindwing similar, the entire area, which

above is salmon-colour, here rather free from blackish irroration and slightly tinged with reddish, distal half of submedian area also rather free from irroration, but not reddish.

N. Kavirondo, Maramas District, Ilala, British East Africa, 4500 ft., June 20, 1911 (S. A. Neave). Type in coll. Brit. Mus.

A very distinct species, entirely without the discolorous distal borders of the other species of *Chlorodrepana*.

#### 58. *Gelasma insulsata* (Warr.).

*Euxena insulsata* Warr., *Nov. Zool.* iv, p. 39.

This species is clearly a *Gelasma* by all characters. On my first examination of Warren's type I noted the basal expansion of the hindwing, which would place it in my Group V., but by some unaccountable oversight I ignored this note later, and left the species in *Euxena* (*Gen. Ins.* 129, p. 64), although with a query on account of the pectinate ♂ antenna. I have recently re-examined the type.

#### 59. *Gelasma albitaenia* spec. nov.

♂ ♀, 28–34 mm. Face ochreous, with lower edge white. Palpus ochreous above, white beneath. Antennal shaft white proximally, ochreous distally; pectinations ochreous. Vertex white, a band posteriorly concolorous with thorax. Thorax above olive-green mixed with white; abdomen paler; both beneath white.

*Forewing* coloured and marked nearly as in *spumata* Warr. (*Nov. Zool.* xiii, p. 88), but wanting the dark cell-spot and with the white subterminal line broad and conspicuous, somewhat indented at R<sup>2</sup> and in submedian area. In this it more resembles *thetydaria* Guen., which has longer, more fuscous pectinations, much broader, differently placed lines, rather broader hindwing, etc.—*Hindwing* slightly narrower than in *spumata*, the tail at R<sup>3</sup> slightly less pronounced; coloured and marked similarly to that species, cell-spot wanting; the white subterminal much narrower and less conspicuous than on forewing.

Underside whitish, similarly but much more faintly marked, almost unicolorous.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October–December 1910 (A. S. Meek). Type ♂ in coll. Rothschild. Also a ♀ from Setekwa River, September 1910 (coll. Rothschild), and a further example in coll. Brit. Mus.

#### 60. *Gelasma smaragdina* spec. nov.

♀, 29 mm. Face green. Palpus rather slender, twice diameter of eye, terminal joint moderate; green, paler beneath. Head green; a fillet and base of antenna white. Thorax and abdomen green above, the latter with small white spots. Fore-femur and tibia green above.

*Forewing* with apex sharp, termen almost smooth, oblique, scarcely convex; SC<sup>1</sup> curved, successively approaching C and SC<sup>2</sup> (on the right wing in the unique type touching the former, thus certainly variable in the species), DC deeply incurved, R<sup>2</sup> much before middle, M<sup>1</sup> separate; rather bright, light blue-green, costal edge (except at base) light purplish-fuscous strigulated with whitish; lines and discal spot (rather near first line, cell being short) much yellower green; first line from before one-fourth costa to one-third hindmargin, excurved and sinuous, accompanied proximally by faint pale shading; postmedian at three-fifths, slightly

incurved between radials and posteriorly, slightly excurved between, accompanied distally by a series of white vein-spots; terminal line dark brown, thickest at vein-ends, gradually narrowing (in places almost interrupted) between; fringe very pale whitish yellow. *Hindwing* with termen subcrenulate and a moderate tooth at  $R^3$ ; cell one-third, C closely appressed for a short distance,  $R^2$  from very near  $R^1$ ; cell-spot, postmedian and terminal lines and fringe as on forewing.

Under-surface whitish blue-green, costal half of forewing brighter green with whitish, fuscous-spotted costal edge except at base; no other markings.

Mount Goliath, March 1911 (A. S. Meek). Type in coll. Rothschild.

More vivid green than most of the genus.

#### 61. *Gelasma balteata* (Warr.).

The type of this species (*Nov. Zool.* xiv. p. 137) is a ♂ in worn condition, the palest parts therefore appearing clearer white than would otherwise be the case. I have now before me two ♀ from Mount Goliath, February 1911, in beautiful condition, which may possibly represent a local race, but are probably typical of the species. Their size is larger (30–32 mm.), the elbow in the termen of the hindwing appears slighter, the white areas of both wings are well speckled with green, terminal line green, fringe whitish, tinged with green.

The ♀ palpus is slender, with the terminal joint moderately elongate. In all three specimens  $SC^1$  anastomoses with  $SC^2$ .

#### 62. *Gelasma bicolor privata* subsp. nov.

♂, 24 mm. Differs from typical *bicolor* Warr. (*Nov. Zool.* xiii. p. 88) in its slightly larger size, rather less strong tail to hindwing, slightly whiter, slightly less irregular lines, with the accompanying green shades rather less thick, the postmedian and the cell-spots obsolete beneath, the underside of hindwing, and of forewing at distal and posterior margins, being whitish, the rest of forewing greener. The third joint of the palpus looks slightly longer, but this may be merely a matter of position or exposure, as no precise measurements have been possible.

$SC^1$  of the forewing arises from the cell and anastomoses at a point with C, afterwards closely approaching  $SC^2$ ;  $R^1$  is connate or barely stalked; C of hindwing anastomoses at slightly more than a point with the cell,  $R^2$  arises very near  $R^1$ . Antennal pectinations coarse and curved, as in *Thalassodes*; hindtibia dilated, with hair-pencil and very short terminal process.

Mount Goliath, January 1911 (A. S. Meek).

#### 63. *Gelasma submixta* spec. nov.

♀, 22–24 mm. Near *commixta* Warr. (*Nov. Zool.* xiii. p. 89), similarly coloured but less mixed with white, smaller, both wings rounder, forewing with the postmedian line more curved, bearing no white vein-dots distally. The green lines and cell-spots are not on the whole very conspicuous—*i.e.* not greatly darkened; the dark terminal line is marked chiefly—in some examples only—at the vein-ends. The structure seems quite to agree with that of *commixta*, the palpus slender, with both second and third joints long, forewing with  $SC^1$  from cell, anastomosing with C and nearly always with  $SC^2$  also,  $R^1$  stalked, DC incurved, hindwing with  $R^2$  from very near  $R^1$ . The similarity in colour, shape, palpus, etc.,

to *Prasinocyma debilis* raises a doubt whether the delimitation of the genera *Gelasma* and *Prasinocyma* is at present satisfactory; the palpal and venational structure and the degree of angulation of the termen of the hindwing seem to show all kinds of intergradations, and possibly the two will have to be merged together. Turner has already (*Proc. Linn. Soc. New S. Wales*, xxxv. p. 559) placed one angled-winged species of the present group (*centrophylla* Meyr.) in *Prasinocyma*.

Mount Goliath, January—February 1911 (A. S. Meek), 7 ♀♀ in coll. Rothschild. Also a ♀ from Dinawa, British New Guinea, 4000 ft., August 1902 (A. E. Pratt) in coll. Bethune-Baker.

The curious fact that *bicolor* and *commixta* Warr. (both from Angabunga River) are only known in the ♂ and ♀ sex respectively, and *bicolor privata* and *submixta* Prout (both from Mount Goliath) the same, suggests a possibility—in spite of some difficulties—that they may prove to be sexes of a single species, occurring in two distinct races, both rather strongly dimorphic sexually; in both cases the tail of the hindwing would be slighter in this Mount Goliath race.

#### 64. *Prasinocyma panchlora* spec. nov.

♂ 28 mm. Shape and colour of *vermicularia* Guen., differing in the green race, more broadly white vertex and uniformly green wings without the whitish strigulation and without darker green cell-mark. The costal edge of the forewing is narrowly whitish ochreous, perhaps a little paler than in *vermicularia*. Possibly also the abdomen is a little more slender. From *chloroprosopa* Prout (*Ann. Transv. Mus.* 1913, p. 194), to which it comes still closer, *panchlora* differs in its somewhat lighter green colour, pale costal edge and absence of the white hindmarginal spot of the forewing. The structure is typical, the hindtibial hair-pencil rather long but slender, white; forewing with  $SC^1$  anastomosing with C,  $R^1$  connate,  $M^1$  connate; hindwing with  $SC^2$  shortly stalked,  $M^1$  scarcely stalked.

Simonstown, Cape Colony, November 1903 (P. de la Garde). Type in coll. Brit. Mus.

#### 65. *Prasinocyma degenerata* spec. nov.

♂, 20–22 mm. Face and palpus reddish brown; palpus with second joint reaching just beyond frons, third joint rather short, distinct. Antennal shaft white at base, then ochreous; pectinations rather long. Vertex green, extremely narrowly edged with white in front. Thorax and abdomen above green, beneath white, anal tuft white. Foreleg red above; (middle legs lost;); hindleg white, with a short pencil from end of femur and another from base of tibia; tarsus abbreviated (one-half tibia).

Wings moderately opaque green, not strigulated with whitish.—*Forewing* with costal edge narrowly pale ochreous; an indistinct dark green cell-spot; fringe concolorous proximally, whitish distally.—*Hindwing* the same, except costal edge.

Under-surface unmarked; of forewing much paler green, becoming whitish green posteriorly; of hindwing whitish green.

S.E. Ruwenzori, 3500 ft., May 16, 1906 (Hon. G. Legge and A. F. R. Wollaston). Type in coll. Brit. Mus. Also a less perfect ♂ from Gabt el-Meghahid, White Nile (H. N. Dunn).

An inconspicuous little species of a more opaque and less bluish green than



*vermicularia*, the build rather more compact. In the forewing  $SC^1$  is free,  $R^1$  connate,  $M^1$  connate; in the hindwing  $C$  is closely approximated to the cell to almost one-half,  $SC^2$  well stalked,  $M^1$  well stalked.

66. *Prasinocyma geminata* spec. nov.

♂ ♀, 29–34 mm. Face and head green, extremely narrowly white between the antennae. Palpus with third joint in ♂ rather short, in ♀ quite moderate; red above, white beneath. Antennal shaft whitish; pectinations in ♂ moderately long, ochreous. Thorax and abdomen dorsally green, the latter with small white spots and white anal extremity. Fore and middle legs crimson above and on inner side; hindleg white, hindtibia in ♂ somewhat dilated, with slender pencil.

*Forewing* very broad;  $SC^1$  free (in one wing of one example exceptionally running into  $C$ ),  $R^1$  not or scarcely stalked,  $M^1$  separate; very pale blue-green, so densely marked with bright green as to leave only fine spots and strigulation of the pale colour (similar to *pulcherrima* Swinh.); costal edge narrowly pink, becoming more ochreous towards apex; discal dot small, black; no other markings.—*Hindwing* ample, apex somewhat squared, termen bluntly elbowed at  $R^3$ ,  $M^1$  separate at origin from  $R^3$ ; concolorous with forewing; a small black discal spot on  $DC^3$ , a more elongate green, posteriorly black-marked one on  $DC^2$ . Underside paler, unmarked; costal edge of forewing as above.

Nairobi, British East Africa, 3 ♂♂, 1 ♀, April 21—May 3, 1911 (T. J. Anderson), all in coll. Brit. Mus.; the type (♂) dated May 3. Also a ♂ from the same locality, May, in coll. Bethune-Baker.

Differs from *neavei* Prout, which also has a double discal spot on the hindwing, in its much brighter, yellower-green colour, pink costal edge of forewing, much shorter palpus, etc.

67. *Prasinocyma* (?) *debilis* spec. nov.

♂ ♀, 25–28 mm. Head and face green, narrowly white between the antennae. Palpus green above, whitish beneath. Antennal shaft white, pectinations in ♂ strong and coarse, much as in *Thalassodes*. Thorax and abdomen green above, whitish beneath, abdomen dorsally with small white spots at ends of segments. ♂ hindtibia with hair-pencil.

Wings green, smoothly scaled.—*Forewing* with extreme costal edge yellowish; a dentate antemedian white line which does not reach costal margin, its deepest tooth pointing distad on the submedian fold; postmedian also dentate, but scarcely traceable except as a row of white dots on the veins, forming an outward curve through most of its length, incurved behind  $M^2$ ; a small dark green cell-spot; terminal line slightly darkened; fringe concolorous.—*Hindwing* similar, without first line.

Under-surface nearly uniform whitish green, with costal edge of forewing yellow; only in the ♂ with costal part of forewing somewhat greener than the rest.

Mount Goliath, February 1911 (A. S. Meek). Type (♂) in coll. Rothschild. Also 7 ♀♀ from the same locality, January—February.

Rather larger than *fragilis* Warr. (*Nov. Zool.* x. p. 359), not of quite such a full colour, but chiefly distinguished by more strongly incurved postmedian series of dots, more approximated to termen and as a rule less connected into a line, the larger, darker cell-spot not accompanied by white scales, and the different

underside of forewing, that of *fragilis* having a bright green median shade. I have referred, under *Gelasma submixta*, to the affinity of this species (with *fragilis*) to certain members of *Gelasma*.

68. *Prasinocyma seminivea respersa* subsp. nov.

♀, 30 mm. Differs from typical *seminivea* Warr. (*Nov. Zool.* xiii. p. 82) in its somewhat larger size and more uniform white sprinkling, the central area of the forewing, both above and beneath, containing rather less green. The postmedian line appears somewhat more regular in its course; the whitish ante-median line of the forewing is well defined, exangled on the folds and close to the posterior margin. The typical form, moreover, has a clearer white (less green-sprinkled) blotch near the tornus.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

As noted under *Anisozygia*, this species must be removed here. It is perhaps intermediate between the *fragilis* group and the following species.

69. *Prasinocyma scintillans isorrhopia* subsp. nov.

♂ ♀, 30–35 mm. Somewhat larger than typical *scintillans* Warr. (*Nov. Zool.* xiii. p. 81), the white longitudinal spots along the cell-fold more strongly developed, the tornal white markings of the forewing rather ample, the underside of the forewing quite differently coloured, being entirely concolorous with the hindwing (whitish green), only its costal edge quite narrowly dull yellowish.

Mount Goliath, January–February 1911 (A. S. Meek); ♂ (type) and 3 ♀ ♀ in coll. Rothschild, the sexes quite alike.

70. *Prasinocyma nictata* spec. nov.

♂, 26 mm. Face green. Palpus with third joint rather elongate; green above, whitish beneath. Vertex green, narrowly white between the antennae. Antennal shaft white spotted with green, the pectinations green, rather long and coarse, extending to scarcely beyond the proximal half of the antenna, altogether recalling *Thalassodes*. Thorax and abdomen green above, the latter with a rather small but conspicuous white spot at the end of each segment; beneath whitish. Hindtibia with hair-pencil.

*Forewing* rather deep, bright green, costally somewhat more yellowish, the extreme costal edge purplish fuscous; except in the costal region sparsely sprinkled with slightly metallic blue-white scales, a stronger cluster of which surrounds the black cell-dot, particularly on its posterior and distal sides; first line at about 3 mm., fine, whitish, slightly interrupted, not reaching costa, bent outwards on folds and inangled on M and SM<sup>2</sup>; second line near termen, consisting of a sharp series of white vein-dots and a small blotch on posterior margin, the series forming a rather regular curve from SC<sup>5</sup> to SM<sup>1</sup> (the fold); discal spot, outside the blue-white scales, surrounded by a vague purplish-fuscous suffusion; fringe duller than ground-colour, especially in distal half.—*Hindwing* with termen slightly crenulate, a little prominent at R<sup>3</sup>; similarly coloured and marked to forewing, but without first line and with the blue-white scales somewhat reduced.

Underside without markings, hindwing and distal and posterior margins of forewing whitish, the rest of forewing more green, with costal edge yellowish at base, then somewhat fuscous.

Mount Goliath, January 1911 (A. S. Meek). Type in coll. Rothschild.

71. *Prasinocyma obsoleta subobsoleta* subsp. nov.

♀, 36–41 mm. Smaller than typical *obsoleta* Warr. (*Nov. Zool.* xiii. p. 84), less strongly bluish green, the pale lines slightly more distinct, broader, the green discal spots slightly more noticeable.

Mount Goliath, January–February 1911 (A. S. Meek), 5 ♀♀ in coll. Rothschild.

The recently described *delicata* Warr. (*Nov. Zool.* xix. p. 75, as *Chlorochroma*) seems to me somewhat doubtfully distinct from *obsoleta*, but I have not yet compared the types.

72. *Prasinocyma dentatilineata* spec. nov.

♀, 34–39 mm. Closely similar to *obsoleta*, especially the subspecies *subobsoleta*; more blue-green, at the same time with a very minute whitish irroration, the lines stronger, whiter, the antemedian more strongly outbent behind cell, inangled on SM<sup>2</sup>, the postmedian strongly dentate; cell-spot darker green, concise. Both lines distinctly continued on hindwing, whereas in *obsoleta* the first is here faint or often obsolete; discal spot nearly as on forewing. Under-surface with the dark terminal vein-dots rather strongly developed.

Mount Goliath, January–February 1911 (A. S. Meek), 4 ♀♀ in coll. Rothschild.

Two ♂♂, taken at the same time and place, measuring 28–31 mm., possibly belong to this species, being of the same colour and similarly marked, but are very distinct in having on each wing a rather large, black, faintly red-tinged discal dot and strong black dots at the vein-ends; costa of forewing slightly more reddish, darker beneath.

The colour of this species is, except for the minute white irroration, almost exactly that of *punctulata* Warr. (*Nov. Zool.* x. p. 357), which has a red face, finer pale lines, more broadly yellow costal margin of forewing, etc.

73. *Prasinocyma ruficollis* spec. nov.

♀, 40–43 mm. Rather narrower-winged than *obsoleta*, palpus longer (about three times diameter of eye), red above; face with its upper edge very narrowly red, occiput and collar red; wings of the yellowish green of *strigicosta* Warr. (*Nov. Zool.* xix. p. 77, as *Chlorochroma*), forewing with costal edge reddish, both wings with discal spot rather large, very distinct, black mixed with red, weakly discernible beneath, terminal black dots strong though very small.

Mount Goliath, February 1911 (A. S. Meek), 2 ♀♀ in coll. Rothschild.

Apart from other distinctions, the bright red on head and collar will prevent possible confusion with *strigicosta*.

74. *Prasinocyma dioscorodes* spec. nov.

♂♀, 51 mm. Face green; vertex white; occiput green. Palpus green, white beneath, third joint in ♀ elongate. Antennal shaft white; pectinations in ♂ long and coarse, not continuing quite to two-thirds. Thorax and abdomen green dorsally, the latter with rather strong white spots at ends of segments.

*Forewing* with apex acute, tornus well defined, SC<sup>1</sup> anastomosing with C, R<sup>1</sup> stalked, DC<sup>2</sup> sometimes strongly incurved; dark dull green, with costal edge

narrowly whitish; lines white, marked by more or less wedge-shaped spots on the veins and folds; first from one-sixth costa, very oblique outwards to submedian fold, then oblique inwards; postmedian from  $SC^5$  or  $R^1$  at about five-sevenths, the spots on  $R^3$ — $M^2$  nearer termen, those on  $SM^2$  and hindmargin nearer base, somewhat confluent, in the ♀ increased to a white blotch which almost reaches submedian fold; discal spot blackish: fringe with a fuscous line at base, distally white, darker-chequered opposite the veins.—*Hindwing* with discal spot and postmedian line, the latter not appreciably enlarged at inner margin; fringe as on forewing.

Underside uniform whitish green, costal edge of forewing yellowish; fringes without fuscous line at base, but with stronger dark spots at vein-ends.

Mount Goliath, January 1911 (A. S. Meek). Type (♂) in coll. Rothschild. Also a ♀ from Upper Setekwa River, August 1910.

Much larger than *absimilis* Warr. (*Nov. Zool.* viii. p. 193)—of which, however, *simplex* Warr. (*Nov. Zool.* xix. p. 78, as *Dioscore*) = *reversa* Warr. (*ibid.* p. 81, as *Pyrrhaspis*) may be a larger form; darker green, the postmedian row of spots much more out of alignment, the blotch at posterior margin in ♀ much larger (wanting in the *simplex* form), the fringes more strongly spotted, especially beneath. In that species, too, the hindwing venation is almost as in *Thalassodes*, while here the discocellulars are much less oblique, the stalkings of  $SC^2$  and of  $M^1$  are shorter, and  $R^2$  arises nearer to  $R^1$  (in the ♀ very close to it).

#### 75. *Prasinocyma infirma* spec. nov.

♀, 34 mm. Smaller than *glauca* Warr. (*Nov. Zool.* xiv. p. 135), costal margin slightly more rounded, colour less bluish green (near that of *Hemithea distinctaria* Walk.), the rows of white spots arranged about as in *glauca* but much smaller, the spot on  $SM^2$  narrow, oblique outwards, extending so as to reach posterior margin, cell-dots smaller, costal edge less bright yellow, fringe green, the dark terminal dots obsolete above, very small beneath.

Abdomen with small white dorsal spots. Forewing with  $SC^1$  anastomosing with C,  $R^1$  stalked.

Mount Goliath, January 1911 (A. S. Meek). Type in coll. Rothschild.

#### 76. *Prasinocyma deviata* spec. nov.

♂ ♀, 30–31 mm. Face with a few fine, projecting hairs; green, somewhat paler below. Palpus little elongate, second joint with a few fine, projecting hairs beneath; green, paler beneath. Vertex narrowly white; occiput green. Antennal shaft white; pectinations green, long, strong, ending rather abruptly at about four-fifths. Thorax and abdomen dorsally green, the latter with one or two small white spots. Hindtibia in ♂ little dilated.

*Forewing* with apex pointed;  $SC^1$  anastomosing with C,  $R^1$  stalked; bluish green (very pale blue-green with dense deep green irroration), the lines fine, paler, respectively followed and preceded by olive-green shades (narrow bands); first from costa at about one-third, excurved anteriorly, then nearly vertical; second from costa at less than 2 mm. from apex, very slightly excurved at first, then oblique and very faintly incurved to posterior margin at scarcely beyond two-thirds; a small indistinct dark cell-spot near the first line.—*Hindwing* with termen faintly crenulate, slightly bent at  $R^3$ ; marked as forewing, the first line curved, nearer base than on forewing, second rather similarly formed to that of forewing, but not incurved.

Under-surface pale green, costal margin of forewing narrowly pale ochreous, both wings with faint traces of darker postmedian line or band.

Mount Goliath, January—February 1911 (A. S. Meek). Type (♂), two other ♂♂ and one ♀ in coll. Rothschild.

77. *Prasinocyma venata* spec. nov.

♂ ♀, 35–38 mm. Closely similar to the preceding but much larger, ground-colour rather paler, the veins standing out distinctly darker, the lines scarcely paler than the ground-colour, thus chiefly indicated by the accompanying olivaceous bands; first line on forewing less strongly curved costally, on hindwing straight, second line rather farther from termen; both wings with distinct dark green cell-mark, extending the entire length of the discocellulars. Abdomen without white dorsal spots. Face and palpus normal, the latter with third joint rather longer than in *deviata*.

Mount Goliath, January—February 1911 (A. S. Meek). Type (♂), 8 other ♂♂ and one ♀ in coll. Rothschild.

78. *Prasinocyma tripuncta* spec. nov.

♀, 32–34 mm. Face green; vertex white; occiput green. Palpus little longer than diameter of eye, third joint relatively short; green, beneath white. Thorax and abdomen green above, whitish beneath.

*Forewing* with  $SC^1$  free,  $R^1$  stalked (in the type specimen only very shortly); subdiaphanous dull green marked with rather deeper and brighter green; costal edge ochreous; a small opaque green patch at base, followed by green sprinkling, which under the lens is seen to consist of interrupted, longitudinally arranged scaling, its distal boundary vague, especially costally, but apparently at about 4 mm. on costal margin, crossing  $M$  at 3.5 mm. and here marked by a very distinct (less distinct in cotype) dark green spot, then running outwards along submedian fold to 5.5 mm., finally about vertical to posterior margin; cell-spot dark green; postmedian line deeply lunulate-dentate, the teeth directed distad on the veins, that on  $R^2$  projecting much less than those on  $R^1$ ,  $R^2$ ,  $M^1$  and  $M^2$ , the inward curve on submedian fold rather strong.—*Hindwing* with  $C$  approximated to cell for some distance near base; a discal dot and lunulate-dentate postmedian line.

Under-surface paler, almost unmarked, costal margin of forewing yellowish ochreous; discal dots faintly indicated.

Mount Goliath, January—February 1911 (A. S. Meek). Type and cotype in coll. Rothschild.

By texture, scaling, etc., certainly a *Prasinocyma*, though the rather short palpus only just escapes confusion with *Chlorocoma* Turner.

79. *Prasinocyma bipuncta* spec. nov.

♀, 29 mm. Very similar to the preceding, differing as follows:

Rather smaller; head entirely green, except a very narrow white fillet between the antennae; palpus about half as long again as diameter of eye, the third joint very slender and rather elongate (measuring about .5 mm.).—*Forewing* with  $SC^1$  anastomosing with  $C$  and at a point with  $SC^2$ ,  $R^1$  separate; rather more whitish green, the darker scaling rather sparser and more uniformly distributed; costal edge more narrowly and less brightly ochreous above, scarcely ochreous beneath;

subbasal green shading nearly obsolete, on the contrary, a distinct antemedian line present, lunulate-dentate, the teeth pointing basewards on M and SM<sup>2</sup>; no dark green spot on M; discal spot black; postmedian line with the tooth on R<sup>3</sup> as prominent as those on R<sup>1</sup> R<sup>2</sup>, and M<sup>1</sup>; that on M<sup>2</sup>, on the contrary, much less prominent, the inward curve on submedian fold thus appearing less deep.—*Hindwing* with C<sup>1</sup> touching cell at a point only, then rapidly diverging; black discal spot and postmedian line nearly as on forewing.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

#### 80. *Prasinocyma signifera superba* subsp. nov.

♀, 31–32 mm. Larger than typical *signifera* Warr. (*Nov. Zool.* x. p. 360), from the Aroa River, and recently obtained from the Oetakwa River; discal mark of forewing slightly, of hindwing much larger (2.5 mm. × 1.5 mm.), the latter without white circumscription, almost entirely ochreous, strongly overlaid with bright red, the scattered blackish atoms about as in the type form.

Mount Goliath, February 1911 (A. S. Meek), 2 ♀♀ in coll. Rothschild.

#### 81. *Prasinocyma geometrica* spec. nov.

♂, 29 mm. Face, fillet, and antenna whitish. Palpus slender, moderately elongate; green above, white beneath. Crown of head, dorsal surface of thorax, and base of abdomen green; abdomen posteriorly more shaded with fuscous.

*Forewing* with distal margin faintly subcrenulate, more oblique posteriorly to M<sup>1</sup> than anteriorly; subdiaphanous grey-green, the basal area and the region of the cell-spot somewhat dusted with fuscous; a fuscous spot near base, another on SC before first line; first line fuscous, deeply and irregularly lunulate-dentate, somewhat interrupted, only reaching from SC to posterior margin, deeply dentate inwards on M and rather less deeply on SM<sup>2</sup>; a rather large roundish fuscous spot on cell-fold close to end of cell, almost immediately followed by a biangulate fuscous mark which occupies DC<sup>2</sup> and part of DC<sup>3</sup>, then runs outward, is sharply angled again on the radial fold, and terminates at the posterior extremity of cell; postmedian line strongly and irregularly lunulate-dentate, darker grey-green, only marked with fuscous at the extremities of a few of the teeth between the veins; arising 4 mm. before apex, strongly outbent at R<sup>1</sup> and with a very deep curve inwards behind M<sup>2</sup>; termen with a row of fuscous spots at vein-ends.—*Hindwing* crenulate, with a slightly sharper point at R<sup>3</sup>; discal, postmedian, and terminal markings as on forewing.

Underside whitish green, the discal markings faintly showing through.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

Perhaps nearest to *caniola* Warr. (*Nov. Zool.* x. p. 360), but abundantly distinct. The peculiarly formed discal marks, with the aid of some illusion from the fuscous dusting, suggest in some aspects the typical "looping" posture of a Geometrid larva, the roundish spot representing the head, the biangulate mark the body.

#### 82. *Prasinocyma vagrans* spec. nov.

♂, 28 mm. Closely related to *vagabunda* Warr. (*Nov. Zool.* x. p. 361) in structure, colour, and markings. Much smaller, of a slightly fuller green, the markings rather more heavily punctuated in places with rust-colour; postmedian

line right-angled on  $M^1$  (in *vagabunda* only faintly denticulate). Underside of forewing with costal edge broadly tinted with rust-colour, a discal mark on  $DC^2$  the same; of hindwing without spots at ends of  $R^1$  and  $R^3$ . The hindleg appears less dilated, and I cannot find a hair-pencil.

Mount Goliath, February 1911 (A. S. Meek). Type in coll. Rothschild.

### 83. *Prasinocyma phoenicogramma* spec. nov.

♀, 22 mm. Face red; vertex white; occiput red. Palpus scarcely half as long again as diameter of eye, third joint not much elongate. Thorax and abdomen dorsally greenish.

Wings rather pale yellowish green.—*Forewing* with  $SC^1$  anastomosing with  $C$ ; costal edge tinged with red; lines purplish red; first at before one-fourth, curved, not sharply defined; second from costa at beyond two-thirds, parallel with termen, nearly straight or very faintly wavy, distinct; terminal interrupted at vein-ends; discal dot minute, black mixed with red; fringe tinged with pale reddish proximally.—*Hindwing* bluntly angled at  $R^3$ ;  $DC^3$  oblique,  $M^1$  almost connate with  $R^3$ ; first line wanting; second scarcely beyond middle of wing, somewhat incurved between the radials, so as rather closely to approach the discal dot.

Underside with forewing suffused with dull reddish from costal margin to  $M$ , except at extreme termen, otherwise very pale greenish; terminal line and fringes as above.

Mount Goliath, January 1911 (A. S. Meek). Type in coll. Rothschild.

In the absence of the ♂, and of manifest relationship to any known species, the generic position of this neat little species is somewhat uncertain. The basal expansion of hindwing is sufficiently strong to justify a suspicion that the ♂ may possibly prove to be without a frenulum.

### 84. *Prasinocyma oxybeles* spec. nov.

♂, 30–31 mm. Face bright red in upper half, pure white in lower. Palpus little longer than diameter of eye, red, terminal joint mostly white. Vertex white; occiput narrowly bright red. Thorax above green; abdomen somewhat paler (possibly a little discoloured), marked with red dorsally, excepting the first segments, the red enclosing two or three roundish white spots. Legs pale, forefemur and tibia shaded with red.

*Forewing* shaped as in the Neotropical genus *Tachyphyle*, the costa being arched distally, apex acute, termen straight or even faintly subconcave, tornus pronounced; cell produced anteriorly,  $SC^1$  free or anastomosing briefly with  $C$ ,  $R^1$  stalked; green, somewhat olive-tinted (perhaps slightly faded); costal margin crimson (especially in proximal part), extreme edge fuscous; a conspicuous crimson spot at apex, extending into the fringe; lines represented chiefly by red spots on the veins, those of the proximal series the larger, placed in a triangle on  $SC$ , cell-fold and  $M$  (at base of  $M^2$ ) and a fourth on  $SM^2$ , the connecting line very indistinct, deeply outangled in cell and in submedian area; distal series from posterior margin at beyond two-thirds, slightly oblique outwards as far as  $R^1$ , then a little recurved, but scarcely indicated in front of  $SC^2$ , the connecting line extremely indistinct, forming a series of deep lunules proximally to the spots; a red discal spot (in the type specimen somewhat elongate) anteriorly to  $R^2$  and a smaller

one in the middle of DC<sup>3</sup>; extreme distal margin and fringe pale.—*Hindwing* slightly elongate in the direction of tornus, termen almost inappreciably bent at R<sup>3</sup>; cell short (scarcely two-fifths), M<sup>1</sup> well stalked; no proximal markings, cell-spot slight, simple, distal series and termen as on forewing.

Under-surface strongly flushed with crimson (at base of costa of forewing deep crimson), leaving only the apical part, termen and posterior margin of forewing and all the margins of hindwing very pale green.

Mount Goliath, January 1911 (A. S. Meek), 2 ♂♂ in coll. Rothschild.

Very like *Prasinocyma* (?) *papuensis* Warr. (*Nov. Zool.* xiv. p. 134), but distinct in the absence of tail to the hindwing, the red upper part of face and rather more extended red blush on hindwing.

#### 85. *Prasinocyma syntyche* spec. nov.

♂♀, 23–26 mm. Closely similar to *oxycentra* Meyr. (*Proc. Linn. Soc. New S. Wales* (2) ii. p. 888), on an average smaller, ♀ palpus rather longer, costal margin of forewing more reddish at base, the broad white costal border afterwards underlined with yellow, in apical third (or more) more broadly with red than in any *oxycentra*; distal border of both wings more broadly red, completely separating the terminal white vein-dots from the green ground-colour. The discal dots are also on an average somewhat larger, the bend in the termen of hindwing at R<sup>3</sup> generally sligher but varying somewhat.!

Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October–December 1910 (A. S. Meek), 3 ♂♂ (including the type) in coll. Rothschild; Upper Setekwa River, August–September 1910, 3 ♂♂, 1 ♀ in coll. Rothschild; Fak-Fak, Dutch New Guinea, December 1907–February 1908, 3 ♂♂ in coll. Brit. Mus. and coll. L. B. Prout; Wataikwa River, New Guinea, August 1910 (A. F. R. Wollaston), ♀ in coll. Brit. Mus.

#### 86. *Prasinocyma votiva* spec. nov.

♂, 28–30 mm.; ♀ 28 mm. Face and palpus green; third joint of palpus in ♀ moderately elongate. Vertex white, occiput green, a narrow band of deep golden yellow separating the two colours. Antennal shaft white, towards the tip red. Thorax and abdomen green above, whitish beneath. Foreleg reddish yellow on innerside, the coxa green.

Wings yellow-green.—*Forewing* with costal margin at base reddish, the rest pure white, in proximal half posteriorly, in distal half anteriorly edged narrowly with golden yellow; lines pale, lunulate-dentate, very indistinct except on the veins, where the teeth are minutely white; cell-dot mixed blackish and red; terminal line consisting of dark red dashes between the veins, thus intermediate between the spots of *marginepunctata* Warr. and the little-interrupted line of *laticostata*; fringe deep golden yellow, paler at tips.—*Hindwing* with termen slightly bent at R<sup>3</sup>; cell-dot, postmedian, termen and fringe as on forewing.

Under-surface whitish; forewing anteriorly pale green, this colour nearly filling the cell but narrowing somewhat distally, the extreme costal edge yellow.

Mount Goliath, January–February 1911 (A. S. Meek). Type (♂), 2 other ♂♂ and 1 ♀ in coll. Rothschild.

The shape, colour and markings, and the short (sometimes very short) terminal



spurs show the close affinity of this species with the *floresaria* group. Perhaps it is a form of *laticostata* Warr. (*Nov. Zool.* xiii. p. 84), very slightly larger, bend in termen of hindwing rather more feeble, colour yellower green, fringe brighter golden, terminal line less nearly continuous, costal area of forewing beneath more differentiated.

This group and especially *marginepuncta* Warr. (*Nov. Zool.* x. p. 356, ♀ = *Oenospila peristicta* Prout, *Gen. Ins.* 129. p. 162, ♂) and *laticostata* Warr. seem to connect the genus *Oenospila* Swinh. with *Prasinocyma*, and it is to be feared (as I already hinted, *loc. cit.*) that the latter large and less specialised genus will ultimately have to be merged in the small and specialised *Oenospila*, which bears the chronologically antecedent name.

### 87. *Prasinocyma discoprivata* spec. nov.

♂ ♀, 36–40 mm. Face bright green. Palpus with third joint moderately elongate; green, white beneath. Vertex and antennal shaft white; occiput green, separated from the white vertex by a very narrow yellow band or line. Thorax and abdomen green above, white beneath; extremity of abdomen also white above; a yellow dorsal line. Legs mostly white, forecoxa green in front, foreleg smoky on upper and outer side.

Wings apple-green, shaped nearly as in *discata* Warr. (*Nov. Zool.* xiii. p. 83), the bend in the termen of hindwing inappreciable, the termen not even so convex as in most of the allies.—*Forewing* with costa yellow at base, otherwise the extreme edge pure white, narrowly separated from the ground-colour by yellow slightly mixed with reddish brown; a reddish brown spot at apex; lines very faintly pale, little noticeable; first from about one-fourth costa, oblique to posterior margin beyond one-third, slightly outbent behind M and then inbent, but much less irregular than in *discata*; second placed as in *discata* but rather more shallowly dentate; a very small blackish cell-spot touching distal side of DC<sup>3</sup>, a faint red mark on the proximal curve of DC<sup>3</sup>; a yellow terminal line dusted with red-brown proximally and with minute red-brown dots at vein-ends; fringe pale yellow.—*Hindwing* similar except costal edge, the black cell-spot not accompanied by a red mark.

Underside whitish green, costal part of forewing brighter green, including cell but narrowing to apex; costal edge of forewing yellow at base, then white, a red-brown line (thickest towards base) separating this edging from the green colour; the costal extremity of veins C and SC<sup>1-3</sup> also tinged with red-brown and a red-brown spot at apex.

Mount Goliath, January—February 1911 (A. S. Meek), 7 ♂♂, 1 ♀ in coll. Rothschild.

Together with this form were received 4 ♂♂ whose appearance is rendered strikingly different by the presence of a large deep purple-fuscous discal blotch on the hindwing, as large as in the least extreme *discata* but unicolorous. The form may be distinguished as ab. **semidiscata** ab. nov.

This species evidently belongs to the group which seems transitional towards *Gigantotheca* or perhaps towards *Chrysochloroma*; SC<sup>1</sup> of forewing free, or anastomosing slightly with C, DC<sup>3</sup> deeply incurved, R<sup>2</sup> of hindwing from much above middle of DC, R<sup>1</sup> and R<sup>3</sup> both rather shortly stalked; hindleg with strong hair-pencil, all spurs developed.

88. *Prasinocyma perpolluta* spec. nov.

*Chlorochroma polluta* Warr. (*Nov. Zool.* x. p. 356) ♀, nec ♂.

♂, 35 mm.; ♀, 31–35 mm. Differs from *polluta* Warr. (♂) = *bicornuta* Warr. (*Nov. Zool.* xix. p. 75) in having the postmedian line of both wings markedly dentate (in *polluta* only faintly wavy), both lines on forewing accompanied by (or even almost replaced by) red shading, nearly the entire median area of this wing clouded with fuscous-reddish. The size seems to be on an average rather larger. I can find no other distinctions. The structure agrees; palpus in both sexes with terminal joint rather short (especially in the ♂); ♂ hindtibia strongly dilated.

Upper Setekwa River, Snow Mountains, Dutch New Guinea, 2000–3000 ft., September 1910 (A. S. Meek). Type (♂) and ♀ in coll. Rothschild. There is a ♂ from near Oetakwa River in coll. Brit. Mus., and Warren's ♀ *polluta* from the Upper Aroa River, British New Guinea, also belongs here.

Mr. Warren in his description of *polluta* mixed two forms which he has since recognised as species. The possibility is not absolutely excluded that his first idea may prove correct, in spite of the remarkable difference in the shape of the postmedian line. Unfortunately his **type** specimen (the ♂) is of the form (or species) which he has recently named *bicornuta*, and the ♀—belonging to the form which he is now regarding as *polluta*—was nameless. The dimorphism, if such it be, is in any case not sexual.

89. *Prasinocyma intermedia approximata* subsp. nov.

♂ ♀, 38–45 mm. Differs from typical *intermedia* Warr. (*Nov. Zool.* xiv. p. 131) in its larger average size and in the antemedian line of the forewing. This is about 4 mm. distant from the base both at costal and posterior margins, and is **angled outwards** on the median vein. The postmedian line is rather broader, the red discal mark better developed, both above and beneath. The angled antemedian line and the size bring it remarkably near to *latistriga* Warr. (*Nov. Zool.* xiii. p. 84), in which, however, the first line is more oblique (from costal margin at 3 mm. to posterior margin at 5 mm.) and which lacks the pale yellow dorsal line of abdomen, which *intermedia* shares with most of the group.

Mount Goliath, January–February 1911 (A. S. Meek), type and others (♂) in coll. Rothschild; Upper Setekwa River, September 1910, a ♀ in the same collection.

90. *Prasinocyma ruficulmen* spec. nov.

♂, 48 mm. Face green. Palpus red, beneath whitish. Vertex and base of antenna snow-white, the former bounded behind by a red line; occiput green. Thorax and abdomen above green, with a long mediodorsal ridge of brick-red; beneath greenish white. Legs pale, the anterior pair darkened above and on inner side; hindtibia dilated with hair-pencil, spurs short, tarsus about two-thirds tibia.

Wing-shape and aspect of *consobrina* Warr. (*Nov. Zool.* xix. p. 75, as *Chlorochroma*). Whitish green, densely irrorated with blue-green, the veins darker and more olivaceous.—*Forewing* with costal edge red, much paler from just before first line to beyond cell; lines rather thick, orange-red; first from before one-fifth costa, oblique outwards to SC, thence straight to hindmargin at about one-fourth, weakly pale-edged proximally; second from SC<sup>4</sup> at beyond three-fourths, almost straight, nearly parallel with termen, white-margined distally; cell-spot

black, in middle of  $DC^3$ , seated on a curved red-brown mark which occupies the whole of  $DC^2$ — $DC^3$  and projects a prong along the base of  $R^2$ ; fringe red, with small obscure dark spots at vein-ends.—*Hindwing* with both lines equally strong, nearly straight, similarly white-edged; cell-spot rather small, dark green; fringe as on forewing.

Under-surface whitish green, with postmedian line faintly indicated, forewing with costal half dusted with brick-red to beyond middle, the dusting narrowing off distally; fringes brick-red with dark spots extending on to the vein-ends.

♀ quite like the ♂ but larger, expanding about 58 mm.; palpus scarcely longer than in the ♂.

Ninay Valley, Central Arfak Mountains, Dutch New Guinea, 3500 ft., November 1908—January 1909. Type in coll. L. B. Prout, also one from the same locality in coll. Brit. Mus., and I have recently seen it from near Oetakwa River, Snow Mountains, up to 3500 ft., October—December 1910 (A. S. Meek), in coll. Rothschild.

#### 91. *Prasinocyma corolla* spec. nov.

♂ ♀, 40–44 mm. Extremely like the preceding except in its considerably smaller size. Dorsal line white, not red, less raised (more as in *consobrina*, etc.); coloration slightly duller and more uniform, veins less contrasted, especially on hindwing; lines somewhat narrower and of a duller red, first line not pale-edged proximally, on forewing dentate at M and  $SM^2$ , on hindwing less straight than in *ruficulmen*; shading about discocellulars and base of  $R^2$  on forewing broader but rather ill-defined; discal spot of hindwing rather darker; fringes whitish, slightly tinged with reddish proximally, preceded only by a red terminal line, on which, however, the dots at vein-ends are strong, blackish.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type (♂) and ♀ in coll. Rothschild.

Nearly related also to *rufistriga* Warr. (*Nov. Zool.* xiii. p. 85), differing in the less yellow-tinged dorsal line, greyer green wings, duller red markings, first line of hindwing incurved in submedian area, presence of red shading distally to the cell-mark of the forewing and especially in the termen and fringe; in *rufistriga* the terminal red line is weak, and not black-dotted on the veins, the fringe reddish **with a white line at base**. Moreover the ♂ hindtibia is rather thicker in *corolla*, with shorter terminal spurs.

#### 92. *Gigantothea gigas flavimargo* subsp. nov.

♂ ♀, 38–40 mm. Smaller than typical *gigas* Warr. (*Nov. Zool.* x. p. 355), costal edge and fringes clearer golden ochreous, the redder proximal part being much narrowed, dorsal stripe of abdomen similarly clearer than in the type form; discal dots minute, green, less dark than in the type, lines fine, that of hindwing more strongly bent in middle than in the type. Second joint of palpus green above (in the type bright ochreous). The ♂ tibial armature is typical; in *minor* Warr. (*Nov. Zool.* x. p. 355) the terminal spurs are longer, and minute medians are sometimes present, and it is not quite certain that the genus is tenable.

Near Oetakwa River, Snow Mountains, Dutch New Guinea, up to 3500 ft., October—December 1910 (A. S. Meek). Type in coll. Rothschild. Also other examples from this locality and from the Upper Setekwa River, August—September 1910.

*Prasinocyma flavilimes* Warr. (*Nov. Zool.* xiii. p. 83) shows some similarity, but differs in the hindtibial armature, has the fringe light yellow and many other distinctions.

### Strepsichlora Warr.

*Strepsichlora* Warr., *Nov. Zool.* xiv. p. 136 (1907).

*Blechromopsis* Warr., *ibid.* xix. p. 72 (1912).

Not only in structure but also in entire facies these genera are absolutely identical, and the erection of the second was evidently an oversight. Fortunately no synonymy, I think, has been created in the species, though both *costipicta* and *nubifera* are very closely related to *inquinata*, and one or other may perhaps prove a local race of it, while *dissimilis* is equally near to *acutilunata*.

### Oxychora Warr.

*Oxychora* Warr., *Nov. Zool.* v. p. 236 (1898).

*Oxypora* Warr., *ibid.* xix. p. 79 (1912).

I do not think these are more than sections of a single genus. The ♂ structure is identical, as also the facies; but there is a hitherto unrecorded distinction in the ♀ antenna, which may justify our retaining the name *Oxypora* as subgeneric.

The type of *Oxychora* (*tenuis* Warr.) was described from the ♂ alone, but I have now before me a ♀ from near Oetakwa River, Snow Mountains, Dutch New Guinea, October—December 1910 (A. S. Meek), and find it has the antenna strongly pectinate, almost as in the ♂. In *dentilinea* and *spilota*, on the other hand, the ♀ antenna is virtually simple ("closely pubescent"), as recorded by Warren; the same is the case with *batis* Warr., which I have transferred to *Oxychora*.

#### 93. *Oxychora batis eusticta* subsp. nov.

♀. Differs from typical *batis* Warr. (*Nov. Zool.* xiii. p. 78) in having more distinct series of white vein-dots (traceable, but weak, in Warren's type) and longer terminal and toral blotches. Both series of dots on the forewing start in the brown costal margin, the first at about one-fifth, the second at about three-fourths or beyond; first outbent in cell, then nearly vertical to posterior margin; second somewhat oblique inwards to  $R^2$ , then outbent, again strongly inbent, rather near first line from  $M^2$  to posterior margin, which it reaches about the middle. The latter series reproduced on hindwing.

♂. The ♂ of this species is hitherto undescribed; the frenulum is quite short and slender, the basal expansion of hindwing (as also in ♀) well marked; the palpus has both second and third joints slender, smooth and elongate; hindtibia moderately dilated, with hair-pencil, the tarsus rather short. Slightly smaller than the ♀, of a somewhat fuller green, the marginal blotches as a rule considerably smaller, and these (together with all the other "fleshy ochreous" parts) much more strongly coloured, redder. In the absence of the ♂ of *batis batis* it is of course impossible to say whether, or how, the present race differs from it.

Mount Goliath, January—February 1911 (A. S. Meek), 6 ♂♂, 3 ♀♀ in coll. Rothschild.

#### 94. *Metallochlora roseifimbria* spec. nov.

♂, 27 mm. Face red. Palpus with second joint reddish above, whitish beneath, third joint above ochreous. Vertex narrowly ochreous, occiput green,

Antenna ochreous, a short proximal part unicolorous, then with the shaft red-spotted. Thorax and abdomen above green, the latter becoming ochreous towards the extremity; the crests shining deep red.

*Forewing* with  $SC^1$  free,  $SC^2$  arising close before  $SC^3$ ; bright green as in *proximata* Warr. and subsp. *circumscripta* Warr.,\* costal edge ochreous with a few dark dots; discal dot dark red, a very faintly darker green line (scarcely discernible) running from it to posterior margin, parallel with postmedian; postmedian line equally faintly darker green, but rendered more apparent by a thicker, slightly paler green shade which accompanies it distally; nearly straight from costal margin before two-thirds to posterior margin at fully three-fourths; a rather narrow pale yellow line before the terminal, widening midway between the veins and enclosing elongate fuscous marks; terminal line dark, very slender; fringe rose-pink.—*Hindwing* moderately angled at  $R^3$ ; similar to forewing, without first line, postmedian rather less oblique.

Underside yellow-green, unmarked; terminal dark marks and pink fringe nearly as above.

Vella Lavella, Solomons, March 1908. Type in coll. Rothschild.

Differs from *proximata* in the more angled hindwing, position and course of postmedian line (on both wings very much further from termen) and the brighter rose-coloured fringes.

#### 95. *Neromia picticosta* spec. nov.

♂, 22 mm. Face dark red, lower part ochreous; vertex pale ochreous; occiput green. Palpus short, dark red. Antennal shaft pale ochreous, spotted with dark red; ciliation moderate. Thorax and abdomen dorsally green, abdomen not crested. Fore and middle legs red above and on inner side; hindtibia not dilated.

Wings dull bluish green, irrorated with white.—*Forewing* with costal margin pale ochreous, with a dark red basal streak 2 mm. in length, scarcely at all broken into spots, afterwards with a number of rather irregularly distributed red spots, the last close to apex; two broad whitish lines, the antemedian obsolescent at costa, from before one-third, slightly bent in cell, then vertical to posterior margin at a little beyond one-third; postmedian almost straight, almost parallel with termen, about 2 mm. therefrom; fringe concolorous, or slightly paler distally.—*Hindwing* with postmedian continuing that of forewing, straight to beyond  $M^2$ , then very slightly curved away from tornus and narrowing.

Underside paler, especially the posterior part of forewing and entire hindwing; lines obsolete; forewing with costal margin as far as  $SC$  pale ochreous, almost entirely covered with red.

Antananarivo (Chulliat). Type in coll. L. B. Prout.

Probably a little faded, being of exactly the colour which is assumed by the species of the genus *Mixocera* when they have been on the wing a short time. A slender, reddish frenulum is present, thus the species is certainly not a *Mixocera*, but in the absence of the ♀ it cannot be positively stated that it may not have to be removed to *Chlorissa*. It may be added that ♀ material in the African species which have been referred to *Chlorissa* is much wanted; I have recently discovered that one or two are two-spurred, *i.e.* will have to be transferred to *Neromia*.

\* *M. circumscripta* only differs from *proximata* in the slightly broader yellow line before the termen, and is possibly only an aberration.

**Neurotoca Warr.**

This genus must be removed from Group VI., where—pending the discovery of the ♂—I left it in my revision (*Gen. Ins.* 129, p. 228). By the kindness of Mr. A. J. T. Janse of Pretoria I have now been able to examine 2 ♂♂ of *N. endorhoda* Hmps., and to add one to my own collection, and I find that the frenulum is present. The genus may be placed next to *Neromia*, from which it differs in the pectinate antenna in both sexes, crested abdomen (this should be added to the diagnosis), etc. In the generic key it will separate from *Pseudhemithea* under No. 23 :

Antenna pectinate . . . . .	<i>Neurotoca.</i>
Antenna not pectinate . . . . .	<i>Pseudhemithea.</i>

**96. Diplodesma ussuriaria (Brem.).**

*Iodes ussuriaria* Brem. *Mém. Acad. Sci. St.-Pét.* viii. p. 77. t. 6. f. 24 (1864).

*Hemithea ussuriaria* Stgr. *Cat.* (ed. 3). p. 265 (1901); Prout, *Gen. Ins.* 129. p. 170 (1912).

*Hemithea eluta* Wileman, *Tr. Ent. Soc. Lond.* p. 337 (1911).

*Diplodesma eluta* Prout, *Gen. Ins.* 129. p. 252 (1912).

I had never been able to satisfy myself as to the species represented by Bremer's poor figure and brief description until September last, when Herr R. Püngeler, of Aachen, kindly sent for my inspection examples from his collection. There is no doubt that his determination is correct, and that the insect is the same which has been recently described by Wileman as *eluta* and which I placed in *Diplodesma* on account of the stalking of SC<sup>1</sup>. Like my *pudefimbria*, however, it shows in fresh specimens a crested abdomen, and it is still an open question whether my *Diplodesma*, sect. iii., would be best treated as an aberrant section of *Hemithea* or of *Diplodesma*, or as a separate genus intermediate between the two.

**97. Omphax ornatimargo spec. nov.**

♀, 26–31 mm. Face, vertex, palpus, and base of antenna deep purple-red; collar ferruginous. Thorax green above, pale beneath. Fore and middle legs partly purple-red. Abdomen pale, anteriorly more ochreous, a minute ferruginous, purple-mixed crest at base.

*Forewing* broad, even for this genus, termen slightly more ventricose than in the other species; SC<sup>1</sup> in both examples anastomosing at a point with C, free from SC<sup>2</sup>, DC<sup>3</sup> extremely oblique; ground-colour as in *plantaria* Guen., costal margin bright yellowish ferruginous, the edge basally dark purple-red; termen ferruginous, overlaid with a reddish-fuscous pattern consisting of somewhat triangular markings, their apices on the veins, their bases narrowly connected by reddish-fuscous shading between; fringe ferruginous, spotted and dusted with reddish-fuscous.—*Hindwing* the same, the costal margin paler, not marked with red at base.

Under-surface dirty pale yellowish, somewhat dusted with reddish.

Minna, Northern Nigeria, September 17, 1910, and July 1910 (Scott Macfie), type and co-type respectively in coll. Brit. Mus., the latter the larger.

**98. Rhodesia depompata spec. nov.**

♂ ♀, 25–26 mm. Face dirty olive with a slight reddish admixture; vertex white, occiput pale green. Palpus in ♂ shortish, third joint not strongly elongate;

in ♀ with third joint rather long and slender, but much less extreme than in *alboviridata* Saalm., mostly purple-red. Antennal shaft white in proximal half, more reddish in distal; ♂ with rather long pectinations, ♀ not pectinate. Thorax and base of abdomen dorsally green; abdomen otherwise whitish, mixed with purple-reddish dorsally and with two or three small narrow crests.

*Forewing* bright green, costal edge white mixed with purple-pink (lighter than in *viridalbata*, but otherwise similar); discal dot white, a smaller white dot anterior to it on DC<sup>2</sup> (as in *viridalbata*); lines nearly obsolete, the postmedian faintly indicated by a few minute white vein-dots; a fine dark reddish terminal line interrupted by minute white dots at the vein-ends; fringe nearly as in *viridalbata*.—*Hindwing* with C anastomosing with SC to middle of cell; marked as forewing, except the costal edge.

Under-surface whitish green, costal edge of forewing reddish, becoming pale distally; both wings with fine fuscous terminal line, interrupted at the veins.

Johannesburg (J. P. Cregoe). Type (♂) and 2 ♀♀ in coll. Brit. Mus., ex coll. Distant.

In the nearly unmarked wings, with purplish fringes, this species rather recalls a *Heterorachis* than a *Rhodesia*, and even in structure it is not absolutely typical, the less extreme palpus being an irregularity.

#### 99. *Hierochthonia robusta* spec. nov.

♀, 16 mm. Face ochreous, head otherwise whitish. Palpus fully as long as diameter of eye, rather stout, ochreous, more whitish towards base. Antennal shaft whitish at base, becoming more ochreous; shortly pectinate. Thorax and abdomen green above, whitish beneath; abdomen robust. Legs more ochreous.

*Forewing* shaped as in *petitaria* Chr., or termen slightly more oblique; SC<sup>1</sup> well free, R<sup>1</sup> connate with SC<sup>2</sup>, DC<sup>3</sup> curved, becoming strongly oblique, M<sup>1</sup> connate or nearly so; pale yellow-green, closely irrorated with bright grass-green, the resultant tone about as in *petitaria*; costal edge pale yellowish; no markings, only in some lights a faint suggestion of a paler postmedian line, placed rather far distally, and of a darkening of the green colour in the position of the cell-spot. Fringe green proximally, more yellowish distally.—*Hindwing* less elongate costally than in *petitaria*; C anastomosing with SC to about one-half the cell; DC<sup>3</sup> somewhat curved, becoming oblique, R<sup>2</sup> from little above middle of DC, M<sup>1</sup> short-stalked; coucolorous with forewing, unmarked or with faint indication of cell-spot.

Port Sudan, Red Sea (N. E. Waterfield), 2 ♀♀ in coll. Brit. Mus.

The cotype is a sport in venation, SC<sup>2</sup> in both wings bifurcate from rather near its point of origin.

#### *Chloroparda* Prout.

Concerning this genus I wrote (*Gen. Ins.* 129, p. 140): "It is unfortunate to be compelled to found a genus upon a species of which we have only the ♀ before us, but the combination of characters marks it out as abundantly distinct. Should the ♂ frenulum prove to be absent, it must be transferred to the vicinity of *Thalera*, from which it differs widely in venation, but little otherwise." I have now seen a ♂ in coll. Rothschild (also from Burma, the only known habitat), and find, as I suspected, that the frenulum is wanting; antennal pectinations long. I propose placing it next after *Thalera*, and in my key to Group VI,

after No. 14 ("Hindtibia with terminal spurs only"). Its separation can quite simply be effected thus :

Forewing with SC <sup>3</sup> arising after SC <sup>5</sup> . . . . .	<i>Chloroparda</i> .
Forewing with SC <sup>3</sup> arising before SC <sup>5</sup> . . . . .	the rest.

### *Dysdamartia* gen. nov.

Face smooth. Palpus in both sexes quite short, hairy beneath. Tongue present. Antenna not quite one-half length of forewing, in both sexes bipectinate almost to apex, the earlier branches long in ♂, moderate in ♀. Pectus and femora glabrous. Hindtibia in both sexes with terminal spurs only. Abdomen slightly crested. Frenulum wanting in both sexes.—*Forewing* with costa arched, especially at base, apex roundly prominent, termen strongly excised between apex and R<sup>3</sup>, strongly prominent between R<sup>3</sup> and M<sup>1</sup>; cell about one-half, DC curved, becoming oblique, SC<sup>1</sup> from near end of cell, anastomosing at a point or shortly with C, SC<sup>2-5</sup> long-stalked, SC<sup>2</sup> separating first, R<sup>1</sup> separate, M<sup>1</sup> well separate.—*Hindwing* with termen rounded, only straight between R<sup>1</sup> and R<sup>3</sup>, tornus rather pronounced; cell about one-half, DC shortly inbent anteriorly, then rather strongly oblique outwards; C anastomosing at a point or scarcely more with cell near base, SC<sup>2</sup> stalked, R<sup>2</sup> from near R<sup>1</sup>, M<sup>1</sup> well separate.

Type of the genus: *Dysdamartia quaesita* spec. nov.

Near *Chloroparda*, but with SC<sup>2</sup> of forewing arising before SC<sup>3</sup>, termen of hindwing not excised, etc. Differs also from *Thalera* in shape, abdominal crests, etc. The sexes differ greatly in markings in the only known species, which is not at all the case in those genera. In my key, Group VI., the wording under No. 13 had better be slightly changed, as *Dysdamartia* is in a measure intermediate. If we read "Abdomen **strongly** crested" for *Lophostola* and "Abdomen not or **slightly** crested" for the rest, no confusion can arise. The new genus can then be introduced at No. 19 :

Abdomen somewhat crested; forewing with termen deeply excised

*Dysdamartia*.

Abdomen not crested; forewing with termen smooth. *Cymatoplex*; *Mixocera*.

### 100. *Dysdamartia quaesita* spec. nov.

♂, 22-23 mm. Face and palpus red. Antennal shaft pale straw-colour spotted with red. Vertex and thorax above green. Thorax beneath, with legs, largely reddish. Abdomen ochreous, mixed with reddish, especially dorsally.

*Forewing* rich deep green, the costal edge reddish ochreous, a small (occasionally larger) whitish spot between R<sup>3</sup> and M<sup>1</sup> at their base, edged, irregularly and variably, with a rim of mixed black and red scales: fringe shining pale yellowish, mostly purple-blackish at base, and with spots of the same colour extending irregularly and to variable distances across the fringe, the largest and most prominent covering it between R<sup>3</sup> and M<sup>1</sup>.—*Hindwing* pale fleshy, sometimes whitish, always darkening at termen and especially at tornus and inner margin, the dark tornal blotch sometimes mixed with fuscous, always separated from the inner-marginal darkening by a narrow pale space; fringe concolorous with that of forewing, none of the dark spots (or only that at apex) crossing it completely.—*Underside* bright reddish, paler towards inner margin of both wings, especially of forewing; costal edge of forewing bright ochreous.



♀, 26-28 mm. Differs as follows: *Forewing* above rather less bright green and with a very large blotch (either grey or purple-red) from tornus to R<sup>1</sup>, encroaching into cell, on posterior margin occupying at least one-third of wing, on termen reaching at least to M<sup>2</sup>, its proximal edge more or less indented between M and SM<sup>2</sup>; a narrow distal border of the same colour adjoining the blotch, becoming wider round the wing-excision but very narrow again at apex.—*Hindwing* grey, faintly violaceous, in the red-blotched examples strongly suffused with reddish, especially towards inner margin; distinct traces of a darker, pale-edged median line, slightly concave; fringes less darkly marked than in ♂. *Underside* grey, except costal edge of forewing; both wings (especially forewing) with some reddish suffusion basally.

Mount Goliath, January—February 1911 (A. S. Meek), a good series of both sexes in coll. Rothschild; the type ♂ dated February.

Rather variable apart from the sexual dimorphism. In one ♂, in which the normally present spot is abnormally large and crosses M<sup>1</sup>, there is a second, similar but much smaller spot posterior to it, touching M<sup>2</sup>. Two ♀♀ taken in January, both red-blotched, vary in the depth of the colour, and one has a distinct red line along R<sup>3</sup> and red bar along R<sup>2</sup> connecting the blotch with the distal border.

#### *Dichordophora* gen. nov.

Face smooth. Palpus rather strong, second joint reaching beyond frons, rough-scaled above and beneath, third joint distinct, moderate. Tongue developed. Antenna in both sexes pectinate to beyond three-fourths, the branches in ♂ rather long, in ♀ short. Pectus somewhat hairy. Femora nearly glabrous. Hindtibia in ♂ not dilated, in both sexes with terminal spurs only. Abdomen not crested. Frenulum wanting in both sexes. Wings with termen entire. Forewing with cell less than one-half, DC<sup>1</sup> strongly incurved, SC<sup>1</sup> from cell, free, or anastomosing with C, or with C and SC<sup>2</sup>, M<sup>1</sup> not stalked; hindwing with cell less one-half, DC<sup>3</sup> strongly curved, C approximated to cell to about one-half, then rapidly diverging, SC<sup>2</sup> stalked, M<sup>1</sup> separate.

Type of the genus: *Dichordophora phoenix* (Prout) = *Dichorda* (?) *phoenix* Prout, *Gen. Ins.* 129 p. 128.

I described the type species from the ♀ sex only, and was consequently unaware of the absence of the ♂ frenulum; but a reference—even provisional—to *Dichorda* was quite inexcusable, indicating an insufficient examination, for I find the ♀ hindtibia lacks the median spurs. Through the kindness of Mr. J. A. Grossbeck, who has sent me the ♂, I am now able to give a correct generic account of the species. It is quite distinct from the other two-spurred genera of the New World in which the ♂ frenulum is absent (*Anomphax*, *Eucrostes*, and ? *Dyscheilia*). Without disarranging the existing key to the genera, it can be introduced in No. 9 thus:

Palpus moderately long, rough-scaled; hindwing with C approximated to cell to about one-half . . . . . *Dichordophora*.

#### 101. *Omphacodes minima* spec. nov.

♂, 16 mm. Face reddish? (discoloured); vertex white, occiput green. Palpus with second joint rather long, third joint moderate. Tongue apparently wanting. Antennal shaft white, pectinations long, brownish. Thorax and abdomen dorsally green, spotted with cream-colour.

Forewing with  $SC^1$  connate with  $SC^{2-5}$ , anastomosing with C,  $R^1$  stalked,  $M^1$  connate; bright green with costal edge white, small white discal dot and wavy post-median line, the latter not well expressed except as white vein-dots, slightly excurved anteriorly and incurved in submedian area; termen with white dots at the vein-ends; fringe whitish, dark-spotted opposite the veins.—Hindwing similar, the postmedian line still more ill-expressed.

Underside paler, unmarked.

Zungeru, Northern Nigeria (G. B. Simpson). Type in coll. Brit. Mus.

#### 102. *Hemistola tricolorifrons* spec. nov.

♂, 41–42 mm. Face red above, strongly mixed with green in middle, white below. Palpus minute (scarcely half diameter of eye), red above, white beneath. Antennal shaft white, pectinations long, ochreous. Head green, with a narrow white fillet between the antennae. Thorax and abdomen green above, white beneath. Fore and middle legs red above and on inner side; hindleg slender, tibia not dilated.

Wings unusually broad, smooth-margined, thinly scaled, subdiaphanous; green, strigulated with white, as in *Prasinocyma*, no markings, fringe concolourous.—Forewing with  $SC^1$  anastomosing shortly with C,  $R^1$  shortly stalked,  $M^1$  connate; costal margin very narrowly ochreous, still more narrowly edged with red.—Hindwing with C shortly approximated to cell, moderately rapidly diverging,  $M^1$  shortly stalked.

Forewing beneath paler green, becoming whitish posteriorly; costal edge bright red in proximal half. Hindwing beneath whitish.

W. slopes of Mount Kenya, 5000—8500 ft., February 18, 1911 (S. A. Neave). Type in coll. Brit. Mus. Also a precisely similar ♂ from Lamu Island, February 18, 1912 (S. A. Neave).

Apart from the structure this species strongly recalls *Prasinocyma ampla* Warr. (*Nov. Zool.* xi. p. 465), though even broader-winged. The hindwing shows a very strong basal expansion and no trace of frenulum, otherwise I should have suspected a relationship with the slender-winged species of *Heterorachis* (*diaphana* Warr. and *asyllaria* Swinh.).

#### *Lophostola* Prout.

Since publishing my revision I have still further confirmed the absence of the frenulum in this interesting genus (cf. *Gen. Ins.* 129, pp. 229, 252). It is the only one, so far as is yet known, which has preserved the *strong* abdominal crests (which tend to disappear in the specialised forms) with the loss of the ♂ frenulum, and my "perhaps," in discussing the subject on p. 2 of my work, can be deleted.

#### 103. *Lophostola cara* spec. nov.

♂. Differs from *annuligera* Swinh. (*Ann. Mag. Nat. Hist.* (8) iii. p. 94) in its smaller size, slightly brighter, less bluish green colour, lack of dark spotting on the ochreous costal margin of forewing, bright red discal spot on each wing, not pale-centred and only very finely and indistinctly pale-surrounded, more yellowish (not whitish) fringes, with no prominent fuscous line at base, the spots in the middle of fringe more reddish fuscous; abdominal crests likewise somewhat more reddish. In addition, the two lines of the forewing do not terminate in markedly

enlarged white spots on posterior margin; on the other hand, the first line is traceable, almost uninterrupted, as far as to vein M, excurved in submedian area. Tooth at R<sup>3</sup> of hindwing somewhat sharper.

Bibianaha, Gold Coast, November 1911 (H. G. F. Spurrell). Type in coll. Brit. Mus.

As a typical specimen of *annuligeru* was taken by Mr. Spurrell in January 1912 at the same locality, it is just possible that, in spite of its different aspect, *cara* is a seasonal form of that species.

#### 104. *Berta arfakensis* spec. nov.

♂ ♀, 24 mm. Shape, coloration, and aspect of *chrysolineata*, which also occurs in the Ninay Valley. ♂ antenna pectinate for less than half its length (in *chrysolineata* to beyond one-half).—*Forewing* with basal area white, with only a very few olive markings; an olive band from middle of posterior margin (where it is nearly 2 mm. in width), outcurved a little between the medians, thence parallel with termen, projecting strong teeth distad along the veins; a band running from this band at vein M, crossing the cell to costa at about one-fourth; both these bands enclose large white spots, which tend in places to break them up into pairs of lines; a few olive spots in the enclosed white costal triangle, one on midcosta being the largest; a zigzag olive subterminal line, thickening into two blotches proximally between the radials; a terminal line similarly thickened; fringe chequered white and pale olive.—*Hindwing* with irregular olive blotching at ends of cell, enclosing a round white spot in the projecting lower arm of cell and thickening and extending between the medians so as to join the outer line, which is strongly dentate; subterminal and terminal lines and fringe nearly as on forewing.

Differs in venation in having the angulation of the discocellulars exaggerated in both wings, R<sup>1</sup> of forewing longer stalked, SC<sup>1</sup> still arising beyond it, SC<sup>2</sup> only just before, or even just after, SC<sup>5</sup>, often anastomosing with SC<sup>1</sup>. Superficially, *arfakensis* is best distinguished by having on both wings a continuous white band between the median and distal olive markings.

Ninay Valley, Central Arfak Mountains. Dutch New Guinea (3500 ft.), November 1908—March 1909. Type ♂ in coll. Rothschild with; others of both sexes; also in coll. Brit. Mus. and coll. L. B. Prout.

#### 105. *Berta fenestrata* spec. nov.

♂ ♀, 23 mm. Face and head olive-green, vertex narrowly white. Palpus olive above, white beneath. ♂ antenna pectinated to about two-thirds, the branches long. Thorax and abdomen olive-green above, with white spots; beneath white. Fore and middle legs olive-green, white beneath; hindleg white, faintly tinged with olive above.

Wings dull olive-green, marked with white.—*Forewing* broad, SC<sup>1</sup> anastomosing with C at a point or more, SC<sup>2</sup> arising opposite SC<sup>5</sup>, not (as in all the *olivescens* I have examined) anastomosing with SC<sup>1</sup>; discocellulars of pronounced *Berta* shape; base spotted with white; a white subbasal band not reaching costa, partly confluent (especially just behind M) with the succeeding; a very irregular antemedian white band, projecting and thickening distally in cell and still more in submedian area; a discocellular white patch, broadest anteriorly, where it

encloses a small olive-green spot; an elongate white costal patch anteriorly to this; a postmedian band formed as in *albiplaga* Warr. (*Proc. Zool. Soc. London*, 1893, p. 357, t. 31, f. 5), but rather broader, a more broken band proximally to it, consisting of a broad mark from costa nearly to  $R^2$  (preceded proximally by a small isolated white spot between  $SC^5$  and  $R^1$ ), a quadrate, sub-oblong patch lying on (anteriorly to)  $R^3$  and some smaller spots in posterior half of wing; subterminal spots small, placed on the veins; fringe with white spots in proximal half, continued more weakly in distal, placed opposite the veins.—*Hindwing* similar to that of *albiplaga*, the postmedian band (correspondingly to that of forewing) somewhat thicker, especially in the type specimen ( $\delta$ ).

Under-surface white, with extremely feeble traces of olive markings, especially costally on the forewing.

Vella Lavella, Solomon Islands, March 1908 (type,  $\delta$ ); Arawa, Bougainville, December 1907 (cotype,  $\eta$ ); both in coll. Rothschild, collected by A. S. Meek.

Possibly a local race of *albiplaga* Warr. (of which I only know the  $\eta$ ), with much more white on forewing. The smaller size and much increased white markings distinguish it from *olivescens* Warr., even if the venational difference prove inconstant; the shorter non-pectinate part of the  $\delta$  antenna differentiates it at once from the *chrysolineata* group.

#### 106. *Comostolopsis subsimplex* spec. nov.

$\delta$   $\eta$ , 16–18 mm. Face bright orange; vertex narrowly white between antennae, crown otherwise green. Palpus bright orange, second joint pale beneath, third joint strongly elongate. Antennal shaft whitish,  $\delta$  pectinations more reddish than in *stillata* Feld. Thorax and abdomen green dorsally. Foreleg marked with red above and on inner side.

Wings rather bright green, much less blue than in *stillata*, slightly darker than in *simplex* Warr., costal edge of forewing extremely narrowly ochreous; both wings with dark red discal dot and terminal line, the latter interrupted at the vein-ends and thickened midway between, and with golden yellow fringes (in the  $\delta$  slightly more reddish); forewing with two ill-expressed, wavy, whitish, transverse lines, the outer apparently somewhat dentate, incurved somewhat between the radials and posteriorly, continued on hindwing. In the  $\delta$  the lines are marked with small red dots on  $SM^2$ , that of the antemedian rather larger.

Under-surface whitish green, the forewing with decided red suffusion except at posterior margin; fringes yellowish.

Antananarivo,  $\delta$  (type) and  $\eta$  (Chulliat) in coll. L. B. Prout.

#### 107. *Pyrrhorachis* (?) *marginata* Warr.

*Chlorochroma* (?) *marginata* Warr., *Nov. Zool.* vi. p. 21 (1899).

This species was accidentally omitted from my revision. Described from a single  $\eta$ , from Little Key Island. Palpus long and slender; hindtibia with two very unequal pairs of spurs (Warren overlooked one of the medians); wing-shape somewhat intermediate between that of normal *Pyrrhorachis* and that of *Chloëres*; forewing with  $SC^1$  about connate,  $M^1$  stalked. I am inclined to suspect it is an aberrant *Pyrrhorachis*, but until the  $\delta$  is discovered it cannot positively be proved that it is not a *Prasinocyma* (*Chlorochroma* Warr.), as tentatively suggested by its author. The discocellulars are not at all like those of *Comostola*.

108. *Pyrrhorachis rhodometopa* spec. nov.

♂, 22 mm. Face green, forehead partly crimson. Vertex crimson, between antennae, the rest of the head green. Antennal shaft crimson in basal half, slightly spotted with whitish. Thorax above red in middle, patagia and tegulae green. Base of abdomen green dorsally, dorsum otherwise red.

Wings bright apple-green.—*Forewing* with costal margin yellowish, densely sprinkled throughout with deep crimson; distal margin red, preceded by a very fine yellow line which runs out into dots at the vein-ends; fringe pink proximally, paler and duller distally.—*Hindwing* with termen and fringe as on forewing.

Wings beneath paler, forewing with costal margin fuscous, both wings with elongate fuscous interneural spots at termen, fringe lighter fuscous.

Mount Goliath, January—February 1911 (A. S. Meek), 2 ♂♂ in coll. Rothschild.

Closely related to *ruficeps* Warr. (*Nov. Zool.* xiii. p. 89), possibly a local race, but larger, with less of the face red, the red borders of the wings much narrower, the costal more crimson red, not dotted with fuscous; termen of forewing rather less rounded, hindwing rather less elongate, etc.

**Androzeugma** gen. nov.

Face smooth. Palpus rather slender, with appressed scales; in ♂ rather short, in ♀ moderate, third joint in both sexes distinct, in ♂ rather short, in ♀ more elongate. Tongue present. Antenna in ♂ thick, almost simple, shortly lamellate; in ♀ simple. Femora glabrous. Hindtibia in ♂ not dilated, in both sexes with a pair of short terminal spurs, medians wanting. Abdomen not crested. Wings delicate, rather thinly scaled, termen almost smooth, that of hindwing very slightly bent at R<sup>3</sup>. Frenulum wanting in both sexes. Forewing with cell rather short, SC<sup>1-5</sup> stalked, SC<sup>1</sup> free or anastomosing with C, SC<sup>2</sup> normal, R<sup>1</sup> stalked with subcostals, M<sup>1</sup> stalked; hindwing with cell short, D<sup>3</sup> moderately oblique, C in the ♂ anastomosing with SC, shortly or to less than one-half cell, in ♀ merely appressed, SC<sup>2</sup> rather long-stalked, M<sup>1</sup> stalked.

Type of the genus: *Androzeugma hapala* spec. nov.

Belongs to my Group VI. Although the more slender build, thinner scaling, coloration, etc., strongly suggest that it has no really near affinity with *Mixocera* Warr., the structural variations in the last-named leave few characters which can be rigidly enforced as differential in all cases. The palpal differences are the most convenient; the anastomosis of C of the hindwing with the cell in the *male* is stronger than has been observed outside the five genera separated off at No. 2 in my key, but, curiously enough, is not shared by the ♀. To adapt my key to the reception of this new genus it will be necessary to read (*Gen. Ins.* 129, p. 18):

- |  |                     |
|--|---------------------|
| 18. Palpus in both sexes quite short . . . . .   | 19.                 |
| Palpus moderate to long, especially in the ♀ . . . . .   | 20.                 |
| 20. Face and femora smooth; both wings with M <sup>1</sup> stalked or at least connate . . . . .   | 20A.                |
| Face rough-scaled, femora hairy, both wings with M <sup>1</sup> widely separate at origin . . . . .  | <i>Iulops.</i>      |
| 20A. Antenna in both sexes pectinate (or in ♀ sometimes serrate), build robust, scaling thick, forewing with SC <sup>1</sup> from cell . . . . . | <i>Eucrotes.</i>    |
| Antenna in both sexes simple, build slender, scaling thin, forewing with SC <sup>1</sup> stalked . . . . .                                       | <i>Androzeugma.</i> |

109. *Androzeugma hapala* spec. nov.

♂ ♀, 22–27 mm. Face and upper side of palpus orange; vertex and antenna pale yellowish; occiput green. Thorax and abdomen green above, the latter with yellow dorsal line. Foreleg reddish orange above and on inner side.

Wings whitish green, closely irrorated with blue-green, the resultant tone about as in *Xenochlorodes nubigena* Woll.—*Forewing* with costal edge pale yellowish; lines creamy whitish; first line very indistinct, from costa before one-fourth, oblique outwards to behind M, then bent and falling nearly vertically on hindmargin; postmedian line finely dentate, almost parallel with termen; cell-spot very small, yellow; fringe yellowish.—*Hindwing* similar, without first line.

Under-surface paler, unmarked; costal edge of forewing yellowish.

Zungeru, Northern Nigeria, 4 ♂♂, April 21, 1911 (type), May 15–18, 1911, November 17, 1911, 1 ♀, April 27, 1911 (Scott Macfie); N'Gami Country (F. D. Lugard), 1 worn ♂; all in coll. Brit. Mus.

110. *Allochrotes curvilinea* (Prout).

*Omphacodes curvilinea* Prout, *Gen. Ins.* 129, p. 221 (1912).

I find this species has only two spurs on the hindtibia, thus not an *Omphacodes*. It probably may represent a new genus, the facies being altogether unlike that of *Allochrotes*; but as the ♂ is still unknown and the ♀ presents no very salient characters, it must in the meantime be referred here.

## NOTES ON PALAEARCTIC ZYGAENIDAE.

BY DR. K. JORDAN.

IN *Rom., Mém. Lép.* iii. p. 170 (1887), Dr. O. Staudinger described a new species of Zygaenid from Amurland for which he proposed the new genus *Inope*, mentioning as chief distinguishing characters that veins 7 and 8 of the forewing are stalked, the hindtibia bears two pairs of spurs, and the ♀-antenna is quite smooth. A second species of *Inope* from the same district was described as *I. impellucida* by Graeser in 1888 (*Berl. Ent. Zeits.* 32, p. 108), who also described another semitransparent Zygaenid without markings as *Northia ulmivora*, l.c. p. 107. When writing the descriptions of the Palearctic Zygaenids for Dr. Seitz's *Macrolepidoptera of the World*, I was not acquainted with these three species, and, as all three were said by Staudinger and Graeser respectively to have two pairs of hindtibial spurs, I united them under the generic term *Inope* Stand. (1887), adding the rider under *Clelea* that the species of *Inope* might possibly belong to *Clelea*.

Herr R. Püngeler has been so kind as to send me for examination from his rich collection some specimens of the above species, which confirm my doubt as to the validity of *Inope*, though only partly in the anticipated direction.

The statements as to structure in the original description of *Inope heterogyna* are not all correct. The hindtibia bears only one pair of spurs, not two pairs, and the ♀-antenna is distinctly dentate, but the last two subcostals of the forewing

(SC<sup>4</sup> and SC<sup>5</sup>, = veins 7 and 8) are stalked as stated by Staudinger. As the foretibia does not bear a spur, there remains nothing to distinguish *Inope* from *Procris* (= *Ino*), in which genus the subcostals 4 and 5 are occasionally also stalked. *Inope*, therefore, sinks as a synonym of *Procris*.

Graeser's *ulmicora* has only one pair of hindtibial spurs. Herr Max Bartel, who has acquired the Dieckmann collection containing Graeser's types, also has found but one pair of hindtibial spurs in the types, according to a note on the labels of Herr R. Püngeler's specimens. The species, however, bears a long spur on the foretibia, and therefore must be placed with *Illiberis* Walk. (1854) = *Northia* Walk. (1854, preocc.).

The third species, *impellucida* Graeser (1888), bears two pairs of spurs on the hindtibia, as stated by the author. The subcostals 4 and 5 of the forewing are stalked and the foretibia has a long epiphysis. The species agrees in these characters with *Clelea*, where it should be placed.

The three species of *Inope*, therefore, part company, each finding a resting-place in a different genus.

*Procris heterogyna* Staud. (1887) is similar in colouring to *Procris elegans* Pouj. (1886), which also occurs in Amurland, and is frequently identified with *Illiberis sinensis* Walk. (1854), a species only known with certainty from China and belonging to a different subfamily. The colouring of the body and the dark portions of the wings is of a much blacker tone in *heterogyna* than in *P. elegans*. The antennae are thinner, and the branches of the ♂-antenna only slightly club-shaped, hairy, with a few scales on the dorsal surface, the branches contrasting strongly with those of *P. elegans*-♂, in which they are strongly widened and densely scaled, as in *P. pruni* Schiff. (1776). Both wings are narrower than in *P. elegans*; the subcostals 4 and 5 are stalked, and the anterior cell-angle of the hindwing is much less obtuse than in *P. elegans*, being slightly over 90°. The clasper of the ♂ apparently has no prominent tooth.

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## EXPEDITION TO THE CENTRAL WESTERN SAHARA.\*

By ERNST HARTERT.

## X.

## QUELQUES NÉVROPTÈRES DU SAHARA FRANÇAIS.

PAR LE R. P. LONGIN NAVÁS, S.J.

LA liste qui va suivre représente le produit des chasses névroptériques de M. le Dr. Hartert dans le Sahara algérien pendant l'an 1912. Un premier lot m'a été confié lors de mon heureuse visite au Musée Zoologique de Tring avec les Congressistes du II<sup>e</sup> Congrès entomologique d'Oxford, le 10 août passé; un autre m'a été envoyé dernièrement à Saragosse par le Dr. Hartert.

Je tiens à remercier ici vivement M. le Dr. Hartert par l'obligeance de m'avoir fourni l'occasion d'étudier des formes si intéressantes et par sa générosité me permettant incorporer à ma collection quelques doubles de plusieurs espèces.

Dans l'énumération je suivrai l'ordre des Familles et des Tribus.

## FAM. NÉMOPTÉRIDES.

## Tribu NEMOPTERINI.

1. *Halter halteratus* Forsk.

Oued Mya Sud, 4 mai.—E. de Ghardaïa, 2 juin.—Oued Nça (de Ghardaïa à Guerrara), 3—5 juin. 10 échantillons.

Ces captures étendent considérablement l'aire géographique de l'espèce, connue déjà de l'Asie occidentale et du nord-est de l'Afrique.

[Très nombreux dans l'Oued Mya Sud, venant à la lampe au soir.—E. H.]

## Tribu CROCINI.

2. *Nina chobauti* MacLachl. (Fig. 1).

*Croce chobauti* MacLachlan, *Bull. Soc. Entom. France*, 1898, p. 169.

La présence de la *bulle* aux ailes du ♂ fait entrer cette espèce dans le genre *Nina* Nav.

Le ♂ étant encore inédit, j'en donnerai ici une courte description.

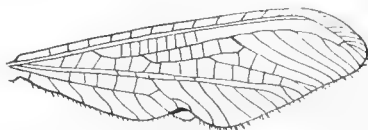


FIG. 1.

*Nina chobauti* M'L. ♂

Aile antérieure ♀.

Antennae pallidae, ante apicem leviter incrassatae, apice acntae. Vertex latior oculo.

\* See *antè*, pp. 1—163.



Ala anterior (fig. 1) reticulatione fusca; stigmatum flavido, hand fusco interne limitato; area costali 12 venulis ante stigma, radiali 2 venulis internis, 9 ante stigma; bulla alba, antorsum linea curva fusca limitata.

Ala posterior bulla valde prominente, subtriangulari, granulosa, sordide alba.

Long. corp. (cum prosost): 10.8 mm.

„ al. ant.: 10.8 „

„ „ post: 33 „

*Hab.* Oued Mya Sud, avril. 3 échantillons ♀, 1 ♂.

Trouvée auparavant à l'Algérie.

### 3. *Nina harterti* sp. nov. (Fig. 2).

Corpus pallidum, rufescente pictum.

Caput albidum; oculis plumbeis, globosis; vertice illis latiore, macula elongata fusco-rufa; prosostomate longo, latitudine capitis cum oculis longiore, apice leviter rufescente, in medio basilari lateraliter fusco lineato.

Prothorax elongatus, in medio anteriore angustatus, albidus, dorso duabus lineis latis longitudinalibus ferrugineis. Mesonotum similiter trilineatum, vel subtotum ferrugineum (♀). Metanotum breve, transversum, rufescens.

Abdomen gracile, cylindricum, stramineum, fusco-ferrugineo lateraliter et ad apicem segmentorum pictum, albedo pilosum.

Pedes graciles, albi; tarsi longis, articulo 1° ceteris simul sumptis  $1\frac{1}{3}$  longiore.

Ala anterior (fig. 2) margine costali ante stigma recto, ultra stigma fortiter curvato; margine posteriore in ♂ ad bullam fortiter excavato; apice obtuso;

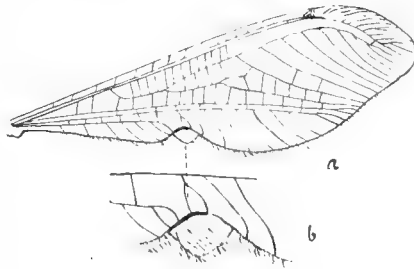


FIG. 2.

*Nina harterti* Nav. ♂

a.—Aile antérieure, ♀.

b.—Bulle de la même.

membrana hyalina, iridea; reticulatione subtota fusca, fimbriis pallidis. Area costalis angusta, 14-18 venulis ante stigma; stigmatum maxima parte albo, interne spatio triangulari ferrugineo. Area apicalis leviter ampliata, aliquot venulis furcatis. Area radialis 2 venulis ante sectorem, 10-14 ante stigma. Sector radii plerumque 9 ramis, primo prope basim furcato, ceteris simplicibus. Venulae intermediae seu inter sectorem et proenbitum numerosae, 10-14, discalae paucae. Bulla subtriangularis, nivea, antice fusco-ferrugineo lineata.

Ala posterior triplo longior, filiformis, alba, venis in quarto basilari fusciscentibus; bulla in 4° vel 5° basilari sita, valde prominente, subtriangulari, albo-grisea, externe linea fusciscente signata.

Long. corp. (cum prosost.): 12 mm.

„ al. ant. : 12.4 „

„ „ post. : 30-34 „

*Hab.* Oued Mya Sud, avril; Ain Guettara, 11 avril. 13 échantillons.

[Très nombreux au soir près d'Ain Guettara.—E. H.]

## FAM. MYRMÉLÉONIDES.

### Tribu MYRMELEONINI.

#### 4. *Myrmeleon cinereus* Klug.

*Myrmeleon distinguendus* Ramb.

S. Oued Mya, 8 avril. 2 échantillons.

Connu déjà de la région méditerranée.

#### 5. *Myrmeleon fasciatus* Nav.

Oued Mya Sud, 8 avril. 7 échantillons. Le type est d'Egypte.

#### 6. *Nesoleon arenosus* sp. nov. (Fig. 3).

*Similis variegato*, Klug.

Caput testaceo-pallidum, macula interantennali fusca; palpis pallidis, ultimo articulo labialium grandi, inflato, fusiformi, fusco; antennis fortibus, fuscis, fulvo annulatis, primis articulis flavidis, clava depressa; oculis nigris; vertice linea longitudinali media angusta et macula bina subrotunda laterali fuscis; occipite fusco punctulato (fig. 3).

Prothorax testaceus, subaeque longus ac latus, pilis pallidis, superne tribus lineis longitudinalibus fuscis, media recta, lateralibus sinuosis. Meso- et metathorax testaceo-flavi, superne quinque lineis longitudinalibus, lateralibus interruptis, signati (fig. 3); inferne fusco lineati.

Abdomen testaceum, inferne fuscum, superne fusco trilineatum, lineis ad apicem segmentorum interruptis; pilis flavidis.

Pedes pallidi; femoribus fusco punctatissimis; tibiis apice fuscis; anterioribus et intermediis fusco punctatis; calcaribus testaceis, primo tarsorum articulo brevioribus; tarsis pallidis, fusco late annulatis.

Alae hyalinae, irideae, apice obtusae.

*Nesoleon arenosus* Nav.

Tête et thorax.

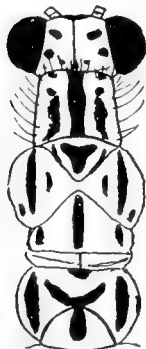


FIG. 3.

*Nesoleon arenosus* Nav.

Tête et thorax.

Ala anterior reticulatione fusco et pallido striata, aliquot venulis angustissime limbatis in tertio apicali et posteriore; stria posteriore ad anastomosim et externa ad rhagma parum sensibilibus; stigmate interne fuscescente; area apicali serie venularum gradatarum fusco limbatarum; area radiali 8 venulis pallidis internis.

Ala posterior pallidior, reticulatione subtota pallida, fusco punctata; stigmate interne leviter infuscato; 7 venulis radialibus internis.

Long. corp. : 21 mm.

„ al. ant. : 20.5 „

„ „ post. : 17 „

*Hab.* Oued Mya Sud, 1-5 mai. 1 échantillon.

7. *Nesoleon puellus* sp. nov.

Minor, fuscus, testaceo varius.

Caput testaceum; fronte nigra inter antennis; palpis testaceis, ultimo articulo labialium externe fusco maculato; vertice fornicato, medio sulcato, duplici linea transversa punctis fuscis; oculis fusco-plumbeis; antennis fortibus, testaceis, fusco annulatis.

Prothorax latior quam longior, pilis pallidis; testaceus; tribus lineis dorsalibus longitudinalibus fuscis. Meso- et metanotum similiter trilineata. Pectus subtotum fuscum, testaceo maculatum.

Abdomen fuscum, albido pilosum; superne bina linea laterali testacea.

Pedes pallide testacei, fusco punctati; femoribus anterioribus et intermediis punctatissimis, posterioribus subtotis fuscis; calcaribus testaceis, primo tarsorum articularum brevioribus.

Alae hyalinae, in tertio spicali latae; stigmatum pallido, interne late fusco limitato; reticulatione subtota fusca, pallido striata; sectore radii 7 ramis.

Ala anterior area apicali serie venularum gradatarum fusco limbatarum instructa. Pleraque venulae radiales, aliquot discales supra rhagma in striam obliquam fusco limbatae; praeterea stria fusca ad ramum anteriorem cubiti et ad anastomosim rami obliqui. Aliquot axillae furcularum marginalium angustissime fusco limbatae. Area radialis 7 venulis internis.

Ala posterior aliquot venulis radialibus limbatis; venula rhagmatica vix sensibilibus; praeterea multis aliis. Venulae radiales internae 5.

Long. corp. : 20 mm.

„ ad. ant. : 18 „

„ „ post. : 15 „

*Hab.* Oued Nça (de Ghardaïa à Guerrara), 3-5 juin. 2 échantillons.

8. *Myrmecaelurus lepidus* Klug.

Oued Mya Sud, 1-6 mai. 1 échantillon. Connu jusqu'à présent de l'Égypte.

9. *Myrmecaelurus trigrammus* Pall.

Espèce de la région méditerranée.

Oued Nça (de Ghardaïa à Guerrara), 3-5 juin—Oued Mya Sud 3 mai. 2 échantillons.

10. *Myrmecaelurus lachlani* Nav.

*Mem. Real. Acad. Cienc. Barcelona*, vol. x. 1912, n. 9., p. 43, f. 20.

Espèce algérienne.

Un échantillon ♀ que je rapporte à cette espèce décrite sur le ♀ seulement. Je vais la décrire en ce qu'elle a de particulier.

♀. Abdomen inferne subtotum fuscum.

Alae reticulatione subtota flava; subcosta ad insertionem venularum manifeste fusca; item aliquot venis ad insertionem venularum leviter fuscatis.

Ala anterior area radiali venulis pluribus, 6-7 ante sectorem, 6-7 ultra sectorem ante stigma.

Ala posterior venulis radialibus 5-5 respective.

Long. corp. : 22.5 mm.

„ al. ant. : 24.5 „

„ „ post. : 22.2 „

*Hab.* Oned Nça (de Ghardaïa à Guerrara), 3-5 juin.

La différence principale que je remarque consiste dans le plus grand nombre de veinules dans le champ costal.

### 11. *Myrmecaelurus medius* sp. nov. (Fig. 4).

*Similis majori* MacLachl. Flavus, fortis.

Caput oculis nigris ; antennis fortibus, crassis, clava parum dilatata ; ferrugineis ; articulo 1° annulo basilari fusco, 2° fusco ; vertice linea longitudinali fusca ; palpis labialibus articulo ultimo puncto externo fusco notato.

Prothorax latior quam longior, antice leviter angustatus ; angulis anticis rotundatis ; margine antico medio leviter concavo ; disco linea media longitudinali fusca. Meso- et metanotum fusco trilineata, lineis lateralibus interruptis. Pectus flavum, fusco pallide lineatum.

Abdomen flavum, pilis flavis, ut in thorace ; superne tribus lineis longitudinalibus fuscis, media latiore.

Pedes flavi, flavo pilosi, fusco breviter setosi ; tibiis anterioribus robustis ; calcaribus testaceis, primum tarsorum articulum superantibus.

Alae (fig. 4) angustae, apice obtusae ; membrana hyalina ; stigmatate flavo-

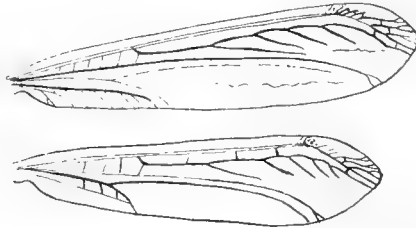


FIG. 4.

*Myrmecaelurus medius* Nav. ♀ Ailes ♀.

(Presque schématiques).

testaceo ; reticulatione flavido et nigro varia ; sectore radii cum initio et apice ejus ramorum nigro.

Ala anterior area apicali venulis gradatis nigris ; area radiali 4 venulis flavis internis ; procubito toto nigro ; cubito cum venulis utrimque ortis flavo, apice nigro ; postcubito nigro, apice excepto. Aliae venulae ramique in disco nigri ; linea plicata flava.

Ala posterior area apicali una alterave gradata venula nigra ; area radiali 3 venulis internis flavis ; procubito toto flavo ; cubito toto nigro cum ramo obliquo confluyente. Aliae venulae ramique discales nigri ; linea plicata flava.

Long. corp. ♀ : 33.5 mm.

„ al. ant. : 31.5 „

Lat. „ „ : 7.8 „

Long. „ post. : 28 „

*Hab.* E. de Ghardaïa, 18 juin. 1 échantillon.

12. *Myrmecaelurus tabarinus* sp. nov.

Flavus, fusco et testaceo varius. Similis *lachlani* Nav.

Caput flavum, fronte inter antennis fusco-ferruginea, linea ante antennis in  $\Lambda$  fusca; vertice sulcato, linea media longitudinali antorsorum incompleta et macula grandi laterali subelliptica fusco-ferruginea; oculis fuscis; antennis ferrugineis, fusco leviter annulatis; clava oblonga, flavida; palpis flavis, articulo ultimo labialium externe fusco punctato.

Thorax flavus, pilis flavis; superne fusco trilineatus, linea media integra, lateralibus interruptis; inferne fusco maculatus. Prothorax latior quam longior, lineis lateralibus ad sulcum interruptis, puncto ante sulcum continuatis.

Abdomen testaceum, flavido pilosum; inferne fascia longitudinali integra, superne fascia media longitudinali ad apicem segmentorum interrupta, lata, alia angusta laterali, ad prima segmenta obsoleta, fuscis.

Pedes flavi, fusco setosi; calcaribus primo tarsorum articulo brevioribus; tarsorum articulis apice ferrugineis.

Alae hyalinae, apice subacutae; reticulatione flava, ad venularum insertionem fusco striata; stigmatate flavo sordido; linea plicata manifesta; area apicali serie venularum gradatarum instructa; area radiales 5 venulis internis seu ante sectorem, 4 inter ortum sectoris et stigma.

Long. corp.: 22 mm.

„ al. ant.: 23 „

„ „ post.: 21 „

*Hab.* Oued Nça (de Ghardaïa à Guerrara), 3-5 juin. 2 échantillons.

13. *Lopezus* gen. nov.

Similis *Myrmecaeluro*, Costa.

Antennae thorace breviores, clava manifesta. Palpi labiales articulo ultimo fusiformi.

Abdomen  $\delta$  unica appendice laterali geniculata ad apicem septimi segmenti abdominis, pilis longis instructa.

Pedes calcaribus primo tarsorum articulo brevioribus.

Alae angustae; venulis costalibus simplicibus; area apicali aliquot vel nullis venulis gradatis; area radiales paucis venulis internis, seu ante sectorem, pauciores 5. Sector radii ultra ramum obliquum cubiti ortus. Ramus obliquus cubiti apertus, seu oblique in marginem posteriorem tendens.

Je prendspour type de ce nouveau genre le *Myrmecaelurus fedtschenkoï* Mac Lachl., in *Fedtschenko's Voyage*, 1875, p. 6, t. 1, fig. 3-4.

Il se distingue aisément du genre *Myrmecaelurus* Costa par la présence d'une seule paire d'appendices geniculés poilus à l'abdomen du  $\delta$  au lieu de deux paires; en outre les veinules radiales internes sont beaucoup moins nombreuses, du même que celles en gradins au champ apical; les éperons plus courts, etc.

14. *Lopezus fedtschenkoï* MacLachl.

*Hab.* Hassi el-Hadjar, sud-ouest d'Ouargla, 15 mars. Un échantillon  $\delta$  entièrement conforme à la description et figure de MacLachlan; seulement l'aile postérieure est sans la sombre tenue représentée dans la figure;  $\eta$  Mraïer, entre Biskra et Touggourt, 23 févr. 1912.

MacLachlan dans *Trans. Ent. Soc. London*, 1898, p. 157, avait déjà cité cette

espèce de l'Algérie : " I may cite the curious *Myrmecaelurus fedtschenkoi*, MacLachl., which occurs in the Province of Oran in a slightly modified form."

Les dimensions de cet échantillon sont :

Longueur du corps : 23 mm.  
 ,, de l'aile ant. : 22.5 ,,  
 ,, ,, post. : 20 ,,

#### 15. *Solter rothschildi* sp. nov.

Testaceus, fusco-ferrugineo varius.

Caput testaceum, facie flava, palpis testaceis, articulo ultimo labialium externe fusco punctato; antennis ferrugineis, testaceo annulatis, inferne pallidioribus, duobus primis articulis flavidis, clava inferne flavida; oculis fuscis; vertice testaceo, ferrugineo maculato.

Thorax testaceus, ferrugineo irregulariter notatus. Prothorax latior quam longior. Pectus testaceum, flavido varium.

Abdomen testaceum, segmentis plerisque late ferrugineo-fusco fasciatis, vel potius fusco-ferrugineum, segmentis basi testaceis; pilis brevibus, ad basim pallidis, ad apicem fuscis.

Pedes testaceo-rufi, fortes, pilis brevibus, albidis; apice tibiaram et articulorum tarsalium leviter fuscatis; calcaribus testaceis, duos primos tarsorum articulos longitudine subaequantibus.

Alae amplae, apice obtusae, hyalinae; reticulatione testaceo et fusco-ferrugineo varia; stigmatate testaceo, interne ferrugineo late limitato.

Ala anterior area costali venulis simplicibus; area apicali serie venularum gradatarum fuscaram; radiali plerumque simplici, cubitali simplici, seu uniareolata; sectore 8 ramis; 5 venulis radialibus internis.

Ala posterior pallidior, reticulatione subtota testacea; venis aliquot ad insertionem venularum fusco-ferrugineo striatis; area apicali sine venulis gradatis, radiali simplici, paucis venalis internis, 2-4; sectore 8-9 ramis; pilula ♂ petiolata, disco testaceo.

Long. corp. : 20-25.5 mm.

,, al. ant. : 23.5-28 ,,

,, ,, post. : 21-25.5 ,,

*Hab.* Oued Mya Sud, 1-5 mai; S. de Ghardaïa, 26-30 mai. 13 échantillons.

*Obs.* J'inclus cette espèce et la suivante dans mon genre *Solter* (*Broteria*, 1912, p. 32), quoique plusieurs échantillons ne possèdent pas un caractère "area radiali partim biareolata vel reticulata ante sectorem." Ce caractère, d'une importance très secondaire, peut être omis dans la caractéristique du genre, ou bien lui ajouter : "quandoque," ou "non semper."

On connaissait de ce genre quelques espèces de Portugal et de Syrie; il est nouveau pour l'Afrique.

[Cette espèce était très commune vers la fin de mai, volant à la lampe.—E. H.]

#### 16. *Solter nævipennis* sp. nov.

Similis *rothschildi*. Testaceus, fusco-ferrugineo varius.

Caput testaceum; oculis fusco-nigris; palpis maxillaribus apice obscuratis, labialibus articulo ultimo grandi, inflato, apice subito mucronato; antennis testaceis, fusco-rufo anguste annulatis.

Thorax testaceus, pilis concoloribus, fusco-ferrugineo varius. Prothorax paulo latior quam longior, angulis anticis rotundatis; dorso fusco-rufo trilineatus, linea centrali integra, cum lateralibus postice coalescente, lateralibus ante sulcum latis, pone sulcum versus medium retractis seu ad centralem approximatis.

Abdomen inferne testaceo-pallidum, superne testaceum, fascia apicali ad singula segmenta ferrugineo-fusca.

Pedes testacei, pilis concoloribus, femoribus dorso ad apicem, tibiis anterioribus et intermediis dorso ad medium et ad apicem infuscatis, posterioribus apice ferrugineis; calcaribus ferrugineis, anterioribus duos primos tarsorum articulos aequantibus; tarsis 1° articulo longiore 2°, sed multo brevior 5°; hoc apice fusco.

Alae latae, apice obtusae; membrana hyalina, reticulatione subtota testacea; stigmata albido; linea plicata manifesta; sectore radii 8 ramis; area apicali aliquot venulis gradatis; area radiali 4-5 venulis internis.

Ala anterior stigmatate grandi, interue ferrugineo limitato; reticulatione ferrugineo et testaceo varia; multis venulis ferrugineo limbatis, atomos discales et maculam rotundatam ad rhagma efficientibus; areis cubitali et postcubitali immaculatis.

Ala posterior penitus immaculata; stigmatate leviter ferrugineo limitato interne; venis aliquot leviter ferrugineo striatis; area radiali 3-4 venulis internis.

Long. corp: 22 mm.

„ al. ant.: 25 „

„ „ post.: 22.5 „

Hab. Oued Nça (de Ghardaïa à Guerrara), 3-5 juin. 1 échantillon.

### Tribu NEUROLEINI.

#### 17. *Neuroleon limbatus* sp. nov. (Fig. 5).

Fuscus, testaceo varius.

Caput fuscum, facie maculis pallidis parum definitis; palpis pallidis, articulo ultimo labialium fusiformis, externe fusco, mucrone elongato; oculis fuscis; antennis fuscis, pallido annulatis, clava ovali, forti, inferne flava.



FIG. 5.

*Neuroleon limbatus* Nav. Prothorax.

Thorax subtotus fuscus, pallido striatus. Prothorax (fig. 5) longior quam latior, disco testaceo, fascia laterali angusta, interne ad sulcum dilatata, media lata, medio longitudinaliter divisa, ad sulcum angustata, fuscis.

Abdomen fuscum, singulis segmentis superne ad basim macula grandi testaceo pallida; pilis fuscis et pallidis.

Pedes pallidi, graciles, fusco punctati et setosi, femoribus et tibiis apice, tibiis anticis etiam medio fusco annulatis; calcaribus testaceis, parum curvatis, duos primos tarsorum articulos aequantibus aut superantibus; tarsorum articulis apice fuscis.

Alae hyalinae, irideae, immaculatae, apice subacutae; stigmatе pallido, insensibili, venulis plerisque fuscis, angustissime fusco limbatis; venis pallidis, ad venulas fusco striatis.

Ala anterior area radiali 7 venulis internis, sectore 6 ramis.

Ala posterior 1 venula radiali interna, sectore 5 ramis.

Long. corp. : 16-17 mm.

„ al. ant. : 15.5-19.5 „

„ „ post. : 14.5-18 „

*Hab.* Ain Guettara 11 mai; Oued Mya Sud, 1-5 mai. 2 échantillons. Plusieurs espèces de ce genre sont connues d'Europe, d'Asie et d'Afrique.

### 18. *Neuroleon nubilus* sp. nov.

Fulvus, fusco varius.

Caput facie palpisque pallidis; vertice et fronte fuscis; antennis thorace longioribus, fulvis, fusco annulatis, clava depressa.

Prothorax paulo longior quam latior, fulvus, pilis lateralibus albis; linea longitudinali media bina externe dentata, alia marginali laterali, duobus punctis intermediis, fuscis. Meso- et metanotum fulva, fusco lineata. Pectus fulvo et fusco varium.

Abdomen fulvum, pallidum, albedo pilosum, linea dorsali media fusca.

Pedes pallidi, fusco punctati et pilosi, apice tibiarnum tarsorumque articulorum fusco; calcaribus testaceis, anterioribus primum tarsorum articulum superantibus, sed secundum haud aequantibus.

Alae hyalinae, irideae, reticulatione fusca, pallido varia.

Ala anterior stigmatе albido interne fusco limitato; area radiali 7 venulis internis; sectore radii 7 ramis; venulis aliquot in quinto apicali et axillis furcularum marginalium anguste fusco limbatis; stria duplici fusca perspicua, posteriore ad anastomosim, brevi, antepicali obliqua longiore.

Ala posterior stria brevi fusca ad rhexima; venulis aliquot antepicalibus et axillis furcularum marginalium leviter fusco limbatarum, limbum seu nubilum efficientibus ad marginem externum; stigmatе pallido, fere insensibili.

Long. corp. : 14.5 mm.

„ al. ant. : 18 „

„ „ post. : 17.5 „

*Hab.* Oued Nça (de Ghardaïa à Guerrara), 3-5 juin. 1 échantillon.

*Obs.* Quoique j'aie signalé pour le genre *Neuroleon* la longueur des éperons antérieurs excédant les deux premiers articles des tarsi, j'inclus dans ce genre cette espèce à éperons un peu plus courts, par l'ensemble de tous les autres caractères. On pourrait modifier la caractéristique du genre ainsi: *Calcaria primum* tarsorum articulum longitudine excedentia.

### 19. *Macronemurus chryseus* sp. nov. (Fig. 6).

Flavus, fusco notatus.

Caput flavum; macula inter antenas fere in  $\times$  fusca; palpis flavis, articulo ultimo labialium grandi, fusiformi, externe ferrugineo; antennis robustis, thorace multo brevioribus, sensim in clavam ampliatis, fulvis, ferrugineo annulatis, articulo 1<sup>o</sup> flavo; oculis fuscis; vertice medio leviter sulcato, callo laterali ferrugineo; occipite puncto laterali fusco.



Thorax flavus, pilis flavo-albis. Prothorax latior quam longior, linea longitudinali media integra fusca, lateralibus subobsoletis, puncto ad sulcum distincto. Mesonotum linea longitudinali media parum sensibili, in scutello longitudinaliter divisa. Metanotum linea fusca media ad scutellum.

Abdomen flavum, flavo pilosum, superne pilis fuscis, segmentis ultimis superne fusco punctatissimis (fig. 6); linea dorsali longitudinali fusca, ad apices segmentorum interrupta; inferne bina linea fusca ad prima segmenta, in 3<sup>o</sup> etiam linea media brevi; cercis ♂ praeecedente segmento parum longioribus, nigro pilosis,



FIG. 6.

*Macronemurus chryseus* Nav. ♂. Extrémité de l'abdomen.

basi declivibus, mox rectis, apice leviter incrassato pluribusque tuberculis asperato (fig. 6).

Pedes flavi, fusco punctati, nigro setosi; calcaribus testaceis, 1<sup>o</sup> tarsorum articulo brevioribus; tarsi 1<sup>o</sup> et 5<sup>o</sup> articulo longitudine subaequalibus, 5<sup>o</sup> longiore, intermediis brevioribus.

Alae hyalinae, longae, apice subaentae; margine externo convexo; reticulatione flava; subcosta ad venulas fusco punctata; stigmatate flavo, parum sensibili, area radiali 2 venulis internis; sectore 7 ramis; linea plicata in tertio apicali manifesta.

Long. corp. ♂ : 3.2 mm.

„ al. ant. : 2.2 „

„ „ post. : 1.9.5 „

„ cerc. : 3 „

*Hab.* Oued Nça (de Ghardaia à Guerrara) 3-5 juin. 1 échantillon ♂.

### Tribu CREAGRINI.

#### 20. *Creagris neurasthenicus* sp. nov.

Minor, fuscus, ferrugineo mistus.

Caput facie flava; fronte inter antennas fusca; vertice fulvo, duplici linea transversa fusca; oculis fuscis; antennis fulvis, fusco annulatis, clava forti; palpis flavis, ultimo articulo labialium fusiformi, externe fusco-ferrugineo notato.

Prothorax paulo longior quam latior; marginibus lateralibus parallelis; in prozona seu ante sulcum fulvus, in metazona fuscus, striola laterali anteriore fulva. Meso- et metanotum fusca, marginibus posterioribus fulvis. Pectus fuscum, ferrugineo notatum.

Abdomen fuscum, pilis fulvis; primis tribus segmentis et margine posteriore aliquot segmentorum ferrugineis.

Pedes pallidi, fusco pilosi et setosi; calcaribus testaceis, tres primos tarsorum articulos aequantibus; tarsi fusco annulatis.

Alae apice subaentae, margine externo convexo, levissime sub ipsum apicem concavo; stigmatate insensibili; reticulatione testaceo-pallida, fusco striata; nullis venulis limbatis, nulla stria fusca sensibili.

Ala anterior venulis plerisque fuscis ; venis ad insertionem venularum fuscatis ; area apicali serie venularum gradatarum ; area radiali 6 venulis ante sectorem. Venae venulaeque ad harum insertionem tenuissime, vix sensibilibiter nisi sub lente, limbatae.

Ala posterior pallidior, venulis plerisque testaceo-pallidis ; area apicali aliquot venulis gradatis.

Long. corp. : 20.5 mm.

„ al. ant. : 20.5 „

„ „ post: 19 „

*Hab.* Nord d'Ain Guettara, 11 avril. 1 échantillon.

## 21. *Nadal* gen. nov.

Similis *Creagri* Ramb.

Caput palpis labialibus articulo ultimo fusiformi.

Pedes graciles, calcaribus rectis, primum tarsorum articulum subaequantibus ; tarsis longis, primo articulo ceteris longiore, tres sequentes longitudine superante, quinto longo, tribus praecedentibus longitudine subaequali.

Alae reticulatione ut in *Creagri*. Ala anterior ramo obliquo cubiti margini postico parallelo, cum postcubito anastomosi conjuncto ; area radiali pluribus venulis ante sectorem, radiali serie venularum gradatarum instructa. Ala posterior una venula ante sectorem radii.

Abdomen longum, ala anteriore plerumque brevius.

La forme des éperons et des tarse de l'espèce que j'ai sous les yeux, tout à fait différente des autres *Creagris*, m'oblige à la séparer de ce genre et la prendre pour type d'un autre nouveau.

## 22. *Nadal anterior* sp. nov. (Fig. 7).

Caput flavidum ; palpis gracilibus, apice ultimi articuli fusco ; vertice parum fornicato, duplici linea transversa fusca, anteriore punctiformi ; oculis fuscis.

Thorax fuscus, ferrugineo notatus, pilis albidis. Prothorax vix longior quam lator, antorsum angustatus ; margine antico rotundato, late testaceo, pilis albis hirtis.

Abdomen totum fuscum, albido breviter pilosum.

Pedes albido pilosi, fusco setosi ; femoribus subtotis ferrugineis vel fuscis ; tibiis

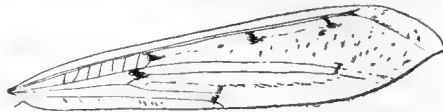


FIG. 7.

*Nadal anterior* Nav. Aile antérieure ♀ (schématique).

pallidis, apice fuscis ; calcaribus testaceis, posterioribus metatarso brevioribus ; tarsis articulo 1° testaceo, intermediis fuscis, ultimo pallido, apice fusco.

Alae longae, apice acutae ; margine externo leviter concavo sub apice ; membrana hyalina ; reticulatione pallido et fusco varia ; venulis gradatis in area apicali.

Ala anterior (fig 7) guttis aliquot fuscis respersa : tribus ad aream radialem,

inter ortum sectoris et stigma, alia ad ramum anteriorem cubiti, vel ad ramum obliquum procubiti; stria obliqua ad anastomosim, alia minore ad rhexma, seu ante apicem cubitorum; atomis in lineam obliquam anteapicalem; praeterea aliquot venulis in medio apicali angustissime fusco limbatis; area radiali 7 venulis internis; stigmatate pallido, interne fuscato.

Ala posterior multo pallidior, sine maculis, limbo angustissimo et pallido ad rhexma, ad venulam radialem ante stigma, ad venulas gradatas apicales.

Long. corp.: 25 mm.

„ al. ant.: 22 „

„ „ post.: 20 „

*Hab.* Est de Ghardaia, 2 juin. 1 échantillon.

### Tribu GYMNOCNEMINI.

#### 23. *Maracanda* MacLachl.

Fedtschenko's *Voyage in Turkestan*, vol. ii., Moscow, 1875, p. 5.

Avec l'aide des espèces suivantes je vais compléter la caractéristique du genre *Maracanda*, en ajoutant les caractères communs à toutes les espèces que je connais de ce genre.

Antennae insertione distantes, thorace breviores.

Abdomen ♀ octavo sternito in lobulos divergentes ad modum furcae postice producto (fig. 8, b); setis apicalibus uncis (fig. 8, a).

Tibae I, II, femoribus I, II breviores.

Alae sectore radii ultra ramum obliquum cubiti orto; area radiali paucis venulis internis, 2-3 in ala posteriore.

Il est utile de transcrire ici les mots de la traduction anglaise du texte russe faite par Hagen (*Canad. Entom.* 1887, p. 211), à propos de la *Maracanda amoena* MacLachl. "At the extremity of the abdomen are found two broad triangular plates, rounded off towards the end, approximate, surrounded internally with black hairs; under these plates are two auxiliary palpi, one under each plate, the lower half of the following abdominal segment deeply cleft in the middle, and with a lengthened fringe joins a long cylindrical growth."

Et ce que le Dr. Hagen ajoute: "Of course I am unable to decide if the Russian translation of the English original is exact; at least only in one place (genitals of female) I find some difficulty in understanding it."

Je pense qu'avec ce qui précède et les figures suivantes (fig. 8, a, b) on rendra claire cette partie.

#### 24. *Maracanda lineata* sp. nov. (Fig. 8).

Caput testaceum, duobus atomis fuscis inter antennis, linea transversa fusca pone antennis; palporum labialium articulo ultimo externe fusco, nitente; vertice puncto fusco laterali anteriore et linea transversa parum definita posteriore; oculis fuscis; antennis fuscis, testaceo annulatis.

Prothorax paulo longior quam latior, antice leviter angustatus; testaceus; pilis pallidis; superne tribus lineis longitudinalibus fuscis notatus. Meso- et metanotum testacea, similiter trilineata; mesonoti linea laterali in duas divisa, metanoti linea laterali lata. Pectus fuscum, testaceo notatum.

Abdomen fusco-cinereum, albido breviter pilosum ; margine postico ultimorum segmentorum testaceo, furca octavi sterniti (fig. 8) ♀ apicem segmenti 9 attingente.

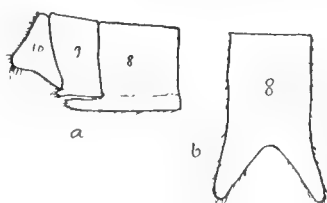


FIG. 8.

*Maracanda lineata* ♀ Nav.

a. Extrémité de l'abdomen.

b. Sternite 8.

Pedes flavidi, flavido pilosi, tibiis tarsisque apice fuscis ; femoribus superne et lateraliter fuscatis.

Alae hyalinae, apice elliptice rotundatae ; reticulatione testaceo-pallida ; stigmatate late fusco, externe pallido ; sectore radii 6 ramis.

Ala anterior area apicali serie venularum gradatarum ; area radiali 4 venulis internis ; disco linea bina fusca longitudinali, anteriore ad procubitum a medio alae ad rhagma, posteriore ad cubitum, ante ortum rami obliqui ad regionem rhematicam ; stria item fusca obliqua ad venulas gradatas externas.

Ala posterior stria obliqua fusca ad venulas gradatas externas subobliterata ; cubito ad originem rami oblique ad rhagma fusco, sed haud limbato.

Long. corp. : 17 mm.

„ al. ant. : 19.5 „

„ „ post. : 17.2 „

*Hab.* Oued Mya Sud, 18 mai. Deux échantillons ♀.

## 25. *Maracanda stigmalis* sp. nov.

*Similis lineatae* Nav.

Caput testaceum ; duobus atomis fuscis inter antennis et linea transversa tenui pone antennis fuscis ; vertice medio sulcato, puncto transverso laterali et linea postica transversa fuscis ; oculis fusco-rufis ; antennis fulvis, fusco annulatis ; articulo ultimo palporum labialium externe fusco ad medium.

Thorax testaceus, superne fusco trilineatus, pilis albidis. Prothorax subaeque latus ac longus. Pectus fuscum, testaceo abunde maculatum.

Abdomen fusco-ferrugineum, albido breviter pilosum ; ultimis segmentis dorso et ad latus, lobulis furcae 8 sterniti ♀ testaceis.

Pedes flavo-testacei, albo pilosi, fusco setosi ; tibiis et tarsis apice fuscis, femoribus superne et lateraliter fusco-ferrugineo notatis.

Alae apice elliptice rotundatae, hyalinae, stigmatate late fusco, vix pallido externe ; reticulatione testaceo-pallida ; venis ad insertionem venularum fusco striatis ; sectore radii fere 5 ramis.

Ala anterior paucis venulis gradatis in area apicali, fusco limbatis ; item limbatis venulis gradatis externis in striam obliquam, et axillis furcularum marginalium, aliquot venulis in ipsa insertione ad procubitum et cubitum ; area radiali 4 venulis internis.

Ala posterior area radiali 2 venulis internis; aliquot venulis gradatis externis et axillis furcularum marginalium angustissime fusco limbatis.

Long. corp. : 18 mm.

„ al. ant. : 18.5 „

„ „ post. : 16.5 „

*Hab.* Nord de El-Golea, 18 mai. Trois échantillons.

Malgré la grande ressemblance de cette espèce avec la précédente, je ne puis nullement l'identifier avec elle. Outre la diversité frappante de coloration, surtout des ailes, je trouve les suivantes différences organiques, entre autres. Le prothorax est moins allongé, les ailes plus courtes, proportionnellement, avec moins de veinules en gradins au champ apical et moins de branches au secteur; le stigme est plus allongé, etc.

26. *Maracanda saharica* sp. nov. (Fig. 9.)

*Similis stigmali* Nav. Minor, fulva, fusco notata.

Caput linea inter antennas, alia pone antennas, medio interrupta, fuscis; vertice fornicato, medio longitudinaliter sulcato et fusco lineato, quatuor punctis fuscis, anterioribus majoribus et magis distantibus; oculis plumbeis; antennis testaceis, fusco annulatis.

Prothorax longior quam latior, antrorsum leviter angustatus; margine antico rotundato; pilis albis; dorso fusco trilineatus, linea laterali ante sulcum subinterrupta. Meso- et metanotum similiter trilineata, linea laterali lata, in mesonoto alia tenui interjecta.

Abdomen fuscum, furca octavi tergiti ♀ fulva, ad apicem noni haud attingente, ramis valde divergentibus, fere in angulum rectum; dorso fascia laterali lata et linea angusta ad connectivum, fulvis.

Pedes testaceo-pallidi, flavido pilosi; femoribus dorso leviter ferrugineo suffusis; tarsorum articulis apice fuscis.

Alae hyalinae, apice elliptice rotundatae; reticulatione subtota testacea, pallida; stigmate fusco, elongato.

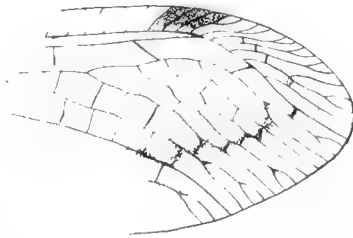


FIG. 9.

*Maracanda saharica* Nav. ♀. Bout de l'aile antérieure.

Ala anterior (fig. 9) venis ad insertionem venularum plerumque fusco punctatis; area apicali serie 5 venularum gradatarum fuscicarum, quarum una fusco limbata; area radiali 6 venulis ante sectorem; sectore 6 ramis; stria fusca obliqua ad venulas gradatas externas manifesta; alia ad anastomosim exigua; aliquot venulis procubitalibus ad insertionem rami anterioris cubiti limbatis.

Ala posterior reticulatione testaceo-pallida, venulis ultimis radialibus et gradatis externis fuscis; area apicali una alterave venula gradata pallida; area radiali 3

venulis ante sectorem; sectore 5 ramis; stria anteapicali fusca tenui ad venulas gradatas externas; aliquot axillis furcularum marginalium levissime fuscatis.

	♂	♀
Long. corp. :	16 mm.	14 mm.
„ al. ant. :	18 „	16.8 „
„ „ post. :	16 „	15 „

*Hab.* Oued Mya Sud, 1-5 mai. Un couple.

Je crois qu'il ne sera pas inutile de donner ici le tableau dichotomique des espèces connues du genre *Maracanda* MacLachl., afin de les mieux connaître et de les rapporter entre elles.

1. Espèce de l'Asie et de l'Europe méridionale; couleur générale jaune pâle; ailes avec quelques atomes bruns, mais sans strie oblique antéapicale; enverg. 30-40 mm. . . . . 1. *amoena* ML.

— Espèces africaines; couleur générale brune ou fauve; antennes testacées, annelées de brun; ailes avec quelques atomes bruns et une strie oblique antéapicale plus ou moins manifeste . . . . . 2.

2. Aile antérieure avec deux stries longitudinales brunes parallèles très manifestes, l'antérieure à la partie externe du procubitus, la postérieure plus longue, le long du rameau antérieur du cubitus; un vestige de strie cubitale à l'aile postérieure . . . . . 2. *lineata* Nav.

— Ailes sans ces stries longitudinales . . . . . 3.

3. Plus grande, plus obscure; abdomen presque en entier brun; champ radial de l'aile postérieure avec 2 veinules internes . . . . . 3. *stigmatis* Nav.

— Plus petite, plus pâle; abdomen avec une bande latérale et une ligne fine fauve de chaque côté à la partie supérieure; 3 veinules internes au champ radial de l'aile postérieure. . . . . 4. *saharica* Nav

## XI.

ON *OVIS LERVIA* PALLAS AND ITS SUBSPECIES.

BY THE HON. W. ROTHSCHILD, F.R.S., PH.D.

(See *ante*, p. 36.)

WHEN I first examined the ♂ Barbary Sheep obtained by Mr. Hartert in the Oued Mya on May 2, 1912, I was only able to compare it with a specimen that died at Tring. I was even then much struck by the pale sandy colour and absence of the median face-line; but on comparing it at the British Museum with an Aurès Mountain ram, presented by Sir Edmond Loder, I was very doubtful, and waited to see more specimens. Meanwhile I had a fine ♂ specimen, obtained in the Aurès Mountains, mounted in exactly the same position as the Oued Mya ♂. On comparing them a vast difference was at once apparent: while in the Oued Mya one the colour was pale sandy rufous, without a trace of a dark face-stripe, with a white patch below and somewhat behind the ears, and the horns were bent down and backward, hardly rising at all above the skull, in the Aurès specimen the colour is deep rufous grey with a distinct face-stripe, and the horns rise considerably above the head before curving backwards, and the downward curve is slighter. I saw at once that I must inspect more specimens. I ascertained that there were a number of Egyptian specimens in the possession of two sportsmen and in Messrs. Rowland Ward's hands. I first of all examined a ♀ head from the mountains east of the Nile which Messrs. Rowland Ward were mounting, and then the fine ♂ belonging to Mr. Gilbert Blaine from between the Dongola Province and Kordofan. I then inspected Mr. G. C. Whitaker's fine ♂ from the Red Sea Province, and lastly some dried skins of specimens from the Dongola region.

The Dongola-Kordofan race is again very distinct; having low bent horns like the Oued Mya form, but the colour is brownish grey on the neck and body, while the head and face is darker grey owing to an admixture of black hair; the beard is so strongly mixed with dark hairs that it appears almost black.

The Red Sea form is similar in most respects to the Oued Mya form, but is deeper rufous in colour and lacks the sub-auricular light patches.

It now remains to consider the nomenclature of these four forms, and we are faced with a difficulty in the case of Pallas's *lervia*, for it was not always known where his specimens came from; but there can be no such doubt in regard to *tragelaphus* Cuvier, which came from Mauretania, and *ornatus* T. Geoffroy, the type of which was shot "outside the gates of Cairo." However, as Pallas founded his *lervia* on Shaw's Fishtall or Lerwee, and this was procured in Algeria, it is quite clear that both *lervia* and *tragelaphus* refer to the North Mauretanian race. The Red Sea race is undoubtedly the one which in Geoffroy's days reached to Cairo, and therefore must stand as *ornatus*, while the Central Saharan and Dongola-Kordofan races must get names. I describe them as follows:

***Ovis lervia sahariensis* subsp. nov.**

♂ ad. Horns strongly depressed, turning sharply down before bending backwards. Uniform pale rufous sand-colour all over; a whitish patch below and somewhat behind the ear, no trace of a median facial stripe.

*Hab.* West Central Sahara.

Type: ♂ ad. Oued Mya, May 2, 1912 (Ernst Hartert and Carl Hilgert coll.).

***Ovis lervia blainei* subsp. nov.**

♂ ad. Horns strongly depressed, turning sharply downwards, but not bent backwards so much as in the other three races.

Neck and body uniformly brownish grey, less rufous than in any of the other races. Sides of head, face, and mask much darker owing to admixture of blackish hairs; beard on rami of lower jaw almost black.

*Hab.* Dongola Province; Kordofan.

Type: ♂ ad., Border of Dongola Province and Kordofan (Gilbert Blaine coll.).

I here append a short key of the four races:

- 1 { Horns strongly depressed, no face-stripe. 2.  
Horns hardly or not at all depressed, an indistinct median face-stripe. *Ovis lervia lervia*.
- 2 { Pelage sandy rufous. 3.  
Pelage brownish grey, beard blackish. *Ovis lervia blainei*.
- 3 { Pelage warm sandy rufous, no white sub-auricular patch. *Ovis lervia ornata*.  
Pelage pale sandy rufous, a white sub-auricular patch. *Ovis lervia sahariensis*.

XII.

ON DIPTERA COLLECTED IN THE WESTERN SAHARA BY DR. ERNST HARTERT, WITH DESCRIPTIONS OF NEW SPECIES.

BY ERNEST E. AUSTEN.

PART I. *BOMBYLIIDAE*.

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THE collection of Diptera formed by Dr. Ernst Hartert during his recent expedition to the Algerian Sahara, although not extensive, includes, as is but natural, a number of species of interest. Owing to official duties, the author has found it impossible in the following pages to do more than give an account of the *Bombyliidae*, but a second instalment of this paper, dealing with the remainder of the collection, will be published as soon as possible. In the present contribution, for the sake of greater completeness, notes on certain specimens taken in Algeria in 1908 by the Hon. L. W. Rothschild, and presented by him to the National Collection, have also been included. With the exception of species distinguished by an asterisk (\*), determinations of previously described species have been supplied or verified by Herr Th. Becker, of Liegnitz, who has made a special study of Algerian Diptera, and to whom the author desires to express sincere thanks for his great kindness.

It only remains to add that Dr. Hartert's collection of Diptera, including the types of new species, has most generously been presented to the British Museum (Natural History).



## ANTHRACINAE.

Genus EXOPROSOPA Macq.

**Exoprosopa beckeri** sp. nov.

♀. Length (8 specimens) 14 to 18.5 mm.; width of head 4 to 5.2 mm.; width of front at vertex 1 to 1.4 mm.; length of wing 16 to 21.5 mm.

*Large, sand-coloured species, with pale, parti-coloured wings, tips and hind borders of which are milky; head and body clothed exclusively with yellowish cream-coloured hairs and scales, bristles on post-alar calli and hind border of scutellum also yellowish; antennal style elongate, often as long or almost as long as third joint of antennae; wings with all posterior marginal cells open, and submarginal transverse vein (recurrent vein) sinuate, not at right angles to second longitudinal vein.*

*Head:* Ground-colour ochraceous-rufous, lower portion of sides of face yellowish horn-coloured, a spot or blotch on vertex, also jowls and basi-occipital region, and sunken portion of occiput slate-coloured or blackish slate-coloured; face only bluntly conical below, not especially prominent; horizontal portion of *proboscis*, from origin of palpi to tip, 4 to 4.75 mm. in length; *palpi* dark brown on outer surface, and clothed with yellowish hair; first and second joints of *antennae* ochraceous-rufous, third joint clove-brown or black.

*Thorax:* Ground-colour of main portion clove-brown or blackish slate, that of scutellum and post-alar calli cinnamon-rufous or chestnut, an ill-defined roughly triangular area on hind border of main portion of dorsum likewise reddish in some specimens, extreme base of scutellum occasionally blackish slate-coloured; hair on collar and upper part of pleurae long and dense, ground-colour of dorsum in undented specimens entirely concealed by hair and scales.

*Abdomen:* Ground-colour (which in undented specimens is completely concealed in same way as that of dorsum of thorax) sometimes same as that of scutellum, except that tergites of first three or four segments each have a median, transverse, blackish slate-coloured blotch at base; in other cases ground-colour of dorsum is mainly blackish slate, but the hind borders of the second to the sixth tergites inclusive, as well as the lateral extremities of the second and third, or second, third, and fourth tergites are cinnamon-rufous, while the hind border of the last tergite is ochraceous-buff, and the venter is cinnamon-rufous, with a greyish clove-brown transverse band, more or less widely interrupted in the middle line, at the base of each ventral scute, commencing with the second; in yet other specimens ground-colour is clove-brown or blackish slate, but posterior angles of second and third tergites, hind borders of third and following tergites, and those of all ventral scutes are ochraceous-buff or buff.

*Wings:* Anterior two-thirds, from base of wing to end of first longitudinal vein, buff or cream-buff (proximal third or two-thirds of marginal cell, proximal two-thirds or three-fourths of second basal cell, and proximal half of anal cell paler); this coloured area bounded distally by an irregular, lighter or darker, mummy-brown or sepia-coloured oblique band, starting from anal cell just beyond middle (or from axillary cell close to median portion of sixth longitudinal vein), filling more or less completely bases of third and fourth posterior cells (usually occupying a larger portion of fourth than of third posterior cell), occupying proximal half or rather more than proximal half of discal cell, forming a border along posterior side of third longitudinal vein from just beyond junction of anterior transverse vein to

distal extremity of discal cell, thence curving across first posterior cell a little beyond its middle and passing into an irregular blotch suffusing submarginal transverse vein and junction of latter with second longitudinal vein, and terminating at distal extremity of first longitudinal vein, but leaving extreme tip of marginal cell, as also that of interior submarginal cell, unoccupied. The degree of development of the oblique band just described varies in different individuals; sometimes the band is well developed, fairly dark, and so broad as greatly to restrict the extent of the buff-coloured area in the proximal portion of the wing; in other instances the central portion of the band is so faint as to be scarcely distinguishable, so that the band is divided into two blotches, one extending from anal cell to base of third posterior cell, the other suffusing the junction of the submarginal transverse vein with the second longitudinal; in all cases the milky hind border makes a deep indentation into the distal portion of the discal cell: first costal cell occasionally mummy-brown. *Squamae* isabella-coloured, fringes whitish.

*Halteres*: Stalks buff or cream-buff, knobs cream-coloured, sometimes darker at base.

*Legs*: Front femora clove-brown, extreme tips cinnamon-rufous, middle and hind femora cinnamon-rufous, lower portion of their anterior surfaces clove-brown, middle and hind femora sometimes mainly clove-brown, all femora, as also tibiae and tarsi, clothed above with whitish scales, bristles on femora, tibiae, and tarsi black; tibiae and tarsi cinnamon-rufous, front tibiae sometimes more or less clove-brown, at least on inside, middle and hind tibiae long and slender.

ALGERIAN SAHARA: type and three para-types from El Meksa, south of El Goléa, 2. iv. 1912; two specimens from the southern portion of the Oued Mya, 5. v. 1912; two from El Goléa, 10-13. v. 1912.

The author has much pleasure in naming this fine species in honour of Herr Th. Becker, in grateful recognition of the generous assistance afforded by him in the working out of Dr. Hartert's collection.

In coloration and general appearance *Exoprosopa beckeri* presents a distinct resemblance to *E. albida* Walk. (? = *E. bagdadensis* Macq.), the type of which is stated by Walker to be from the "East Indies," and to *E. olivierii* Macq., of which the typical example was obtained in Arabia. In neither of these species, however, are the distal extremity and hind border of the wing distinctly milky, as is the case in *E. beckeri*, while the latter is further distinguished, inter alia, by its first posterior cell being open instead of closed, and by the elongation of its middle and hind tibiae.

### ***Exoprosopa arenacea* Becker.**

(*Zeitschr. f. syst. Hym. u. Dipt.*, Bd. vi. p. 151 (1906).)

Three ♀♀ from El Meksa, south of El Goléa, Algerian Sahara, 2. iv. 1912.

According to the original description the wings in this species are "violet-grey," and "harmonise very well with the colour of the sand." The wings in Dr. Hartert's specimens, however, are dark brown, except the tips, hind borders, and an extension from the latter into the distal portion of the discal cell, all of which are either milky-white (two specimens) or light drab-grey (one specimen): the dark colour is sharply differentiated from the pale portion of the wings, and there is no trace of the supernumerary transverse veins mentioned in Becker's description. It will be seen, then, that from the description of the wings alone it would be impossible to recognise Dr. Hartert's specimens as belonging to

*E. arenacea* Becker. Other noteworthy differences, however, exist. Thus Becker describes the first two joints of the antennae as "yellowish-brown," while he states that the last two abdominal tergites are "entirely yellow"; in the specimens before the writer the first two joints of the antennae are clove-brown or black, at any rate above, and the abdominal tergites in question, except their hind borders, are of the same colour.

It may be added that the typical specimen (a ♀) of *E. arenacea* Becker, which is in the Musée Royal d'Histoire Naturelle de Belgique, in Brussels, was obtained at Tilhs de Mela, in the Sahara, on 1. iv. 1893, by Professor Lameere.

Genus MOLYBDAMOEBA Sack.

**Molybdamoeba trinotata** Duf.

(*Ann. Soc. Ent. France*, 2<sup>me</sup> Série, T. x. p. 7, Pl. 1. i. fig. 9 (1852) (*Anthrax*)).

One ♀ from the southern portion of the Oued Mya, Algerian Sahara, 4. v. 1912.

This specimen does not altogether agree either with Dufour's figure, or with his extremely brief description: the type of the species was taken in the vicinity of Madrid.

Genus CYTHEREA Fabr.

\* **Cytherea argyrocephala** Macq.

(*Mém. Soc. royale des Sc., de l'Agric. et des Arts de Lille*, 1840, p. 333 (*Anthrax*); *Dipt. Exot.*, ii. 1, p. 55, Pl. 20. fig. 9 (1840) (*Anthrax*)).

One ♂ from Hammam R'Irha, Algeria, May 1908 (Hon. L. W. Rothschild).

The type of *C. argyrocephala* Macq. was obtained in Algeria, and the British Museum possesses a ♀ of this species from Constantine, 7. v. 1895 (Rev. A. E. Eaton), in which there are three submarginal cells in the right wing. The left wing of this specimen is, however, perfectly normal, and does not exhibit even a trace of a supernumerary transverse vein in the first submarginal cell.

Under the name *Mulio argyrocephalus* Macq., Becker (*Zeitschr. f. syst. Hym. u. Dipt.*, iii. *Jahrg.*, p. 91 (1903)) records the occurrence of this species in Egypt.

BOMBYLIINAE.

Genus GERON Meig.

\* **Geron hybridus** Meig.

(*Klassif.*, i. p. 186 (1804) (*Bombylius*)).

One ♀ from the southern portion of the Oued Mya, Algerian Sahara, 4. v. 1912.

Genus USIA Latr.

**Usia florea** Fabr.

(*Ent. Syst.*, T. iv. p. 412 (1794) (*Volucella*)).

Four ♂♂ and one ♀ from Hammam R'Irha, North Algeria, May 1911 (Hon. L. W. Rothschild and Dr. E. J. O. Hartert).

The Museum previously possessed specimens of this species from the same locality, as well as others from Algiers, taken in both cases in May 1908 (Hon. L. W. Rothschild).

## Genus CONOPHORUS Meig.

**Conophorus bellus** Beck.*(Zeitschr. f. syst. Hym. u. Dipt., Bd. vi. p. 112 (1906) (Ploas bella).)*

One ♂ from Biskra, South Algeria (Hon. L. W. Rothschild and Dr. E. J. O. Hartert).

The type of this species was obtained at Tunis.

## Genus ANASTOECHUS O. Sack.

**Anastoechus retrogradus** Beck.*(Mitteil. Zool. Mus. Berlin, ii. Bd., 2. Heft, p. 17 (1902) (Systoechus).)*

One ♀ from the southern portion of the Oued Mya, Algerian Sahara, 4. v. 1912.

The typical specimens of *A. retrogradus* were taken at Alexandria, Egypt, at the beginning of May, and Bezzi (Brotéria, *Ser. Zool.*, vol. viii. fasc. 2, p. 50, tab. ix. fig. 37 (1909)), who has published a photographic illustration of the species, also records its occurrence at Sidi-Gaber, near Alexandria. Becker (loc. cit.) mentions the capture of a ♀ at Berriane, Southern Algeria (Sabara), on May 28 (Prof. Lamcère), and the British Museum (Natural History) possesses a ♂ and ♀ from Biskra, Algeria, 13. iv. 1895, "visiting *Limoniastrum guyonianum*, Coss. and Dur." (Rev. A. E. Eaton). A second ♀ in the National Collection, from Fontaine Chaude, S. Algeria, 16. v. 1894 (Rev. A. E. Eaton), either represents a variety of *A. retrogradus* Beck., or, as is perhaps more probable, belongs to a new but closely allied species. It is distinguished from the typical form of *A. retrogradus* by its much greater size, measuring 14.5 instead of 11 or 12 mm. in length; by the first joint of the antennae being pale cinnamon-rufous, instead of black or blackish; by the third joint of the antennae being different in shape (suddenly contracted and less tapering) as seen when the head is viewed in profile; and by the greater development of coarse, ochre-yellow or brown-tipped hairs on the front, and of transverse bands of ochraceous hairs on the abdomen.

*Anastoechus retrogradus* Beck. is allied to *A. (Bombylius) miscens* Walk. (*Entomologist*, vol. v. p. 271 (1871)), the type of which was obtained at Arkeko, near Massowah, Eritræa. In *A. miscens*, however, the abdominal bristles are entirely black, the base of the anterior branch of the third longitudinal vein is not rectangular and is devoid of all trace of a recurrent appendix, and the transverse veins are not suffused with brown.

**Anastoechus hyrcanus** (Pall.) Wied.*(Zoologisches Magazin, Bd. i. Stück ii, p. 22 (1818) (Bombylius).)*

One ♂ from Biskra (Hon. L. W. Rothschild and Dr. E. J. O. Hartert).

## Genus BOMBYLIUS Linn.

**Bombylius punctatus** Fabr.*(Ent. Syst. T. iv. p. 408 (1794).)*

One excellently preserved ♂ of this splendid species from Hammam R'Irha, North Algeria, May 1911 (Hon. L. W. Rothschild and Dr. E. J. O. Hartert).

The National Collection previously possessed specimens of *B. punctatus* from

Constantine, 12, 15. v. 1895, and Lac des Oiseaux, 15. vi. 1896, in North Algeria (Rev. A. E. Eaton); from Kambos, Mt. Taygetos, Southern Greece, July, 1901 (Holtz); Corfu, 31. v. 1901 (Rev. F. D. Morice); Odessa, South Russia, 1843 (Dr. Dowler); Galilee, Palestine (B. T. Lowne, F.R.C.S., F.L.S.); and Jericho, Palestine, 13. iv. 1909 (Rev. F. D. Morice).

Becker (*Zeitschr. f. syst. Hym. u. Dipt.*, Bd. vi. p. 97 (1906)) records the capture of an example of this species near Tunis, in the month of May.

**Bombylius fimbriatus** Meig.

(*Syst. Besch.* ii. p. 191 (1820).)

One ♂ from Hammam R'irha, North Algeria, May 1911 (Hou. L. W. Rothschild and Dr. E. J. O. Hartert).

**Bombylius senex** Meig.

(*Syst. Besch.*, ii. p. 216 (1820).)

Two ♀♀ from the Oued Nça, between Guerrara and Ghardaïa, Southern Algeria, 3-5. vi. 1912.

(*To be continued.*)

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XIII.

ORDER RHYNCHOTA.—HOMOPTERA.

BY W. L. DISTANT.

FAMILY CICADIDAE.

1. **Melampsalta cantans**.

*Tettigonia cantans* Fabr., *Ent. Syst.* iv. p. 20. 13 (1794).

North Algeria; Hammam R'hira (May 1911, Rothschild and Hartert).

2. **Pauropsalta aestuans**.

*Tettigonia aestuans* Fabr., *Ent. Syst.* iv. p. 20. 14 (1794).

North Algeria; Hammam R'hira (May 1911, Rothschild and Hartert).

FAMILY FULGORIDAE.

Subfam. DICTYOPHARINAE.

3. **Dictyophara harterti** sp. n.

Head and pronotum ochraceous; lateral margins of vertex above and a central longitudinal carination between eyes, lateral margins and carinations to pronotum, and carinations to mesonotum, virescent; abdomen above greenish ochraceous; vertex beneath ochraceous, the lateral margins and a central carination virescent;

face ochraceous, lateral margins and clypeus virescent; body beneath virescent; legs ochraceous; tegmina and wings hyaline, apices of the first palely infuscate; head long, porrect, slightly but distinctly curved downward, considerably longer than the mesonotum and scutellum together, deeply excavate above, the lateral margins strongly ridged, the apex rounded and a little narrowed; pro- and mesonota with three central longitudinal carinations; tegmina longer than the head, pronotum and scutellum together, the apical third transversely veined; posterior tibiae with four spines.

Length (including tegmen): 12 mm.

South Algeria; S. of Ghardaïa (May 1912).

Apparently allied to *D. ogradensis* Melich. from Somaliland, but differs in having the head, pronotum and scutellum together shorter than the tegmina; from *D. pannonica* Cretz it is distinct by the structure of the head and different coloration.

Subfam. ISSINAE.

4. **Falcius apterus.**

*Cercopis aptera* Fabr., *Ent. Syst.* iv. p. 54 (1794).

North Algeria (Rothsch. and Hart. 1912).

Subfam. FLATINAE.

5. **Rhinophantia longiceps.**

*Phantia longiceps* Put., *Rev. d'Ent.* 1888. p. 367.

Sands of El Arich, S.W. of Touggourt (June 1912); Oued Nça (Ghardaïa to Guerrara, June 1912).

FAMILY CERCOPIIDAE.

6. **Triecphora numida.**

*Cercopis numida* Guér., *Iconogr. Règne Anim.* p. 369 (1829-1838).

Les Glacières de Blida (June 1908, Rothsch. and Jord.).

FAMILY JASSIDAE.

7. **Hecalus dubius.**

*Hecalus dubius* Melich., *Verh. z.-b. Ges. Wien* liv. p. 36. no. 36 (1904).

N. of El-Golea, Algerian Sahara.

I submitted this species to Dr. Melichar, who kindly identified it as his *Hecalus dubius*, described from Southern Abyssinia.

8. **Eupelix producta.**

*Eupelix producta* Germ., *Faun. Eur.* 20. 24 (1817).

Algeria (May 1912).

9. **Athysanus sp.**

Apparently near *A. taeniaticeps* Kbm., perhaps a variety of same?  
Sands of El Arich, S.W. of Touggourt (June 1912).

10. *Athysanus othello* sp. n.

Head and pronotum ochraceous, a series of minute black spots both on the anterior and posterior margins of head, eyes black; scutellum ochraceous with a small black spot at each basal angle and an angulated transverse black line on disk; face black with some scattered small ochraceous spots; cheeks and clypeus ochraceous, the former with an inner marginal row of small dark spots and the latter more or less suffused with piceous; sternum black; abdomen beneath ochraceous, the lateral margins more or less black; legs ochraceous, femora annulated with black, apices of tibiae black, tarsi spotted with black; tegmina ochraceous, sparingly and irregularly spotted with black, the spots small, the most prominent being on each side of the claval suture (at apex and behind middle), and a few on the costal margin; head short, rounded, about three times as broad as long; pronotum finely transversely striate; scutellum moderately obliquely depressed at basal area.

Length: 5 mm.

Oued Nça (Ghardaïa to Guerrara), June 1912.

11. *Deltocephalus melichari* sp. n.

Head very pale stramineous, a small fuscous spot on each side of apex and two somewhat large transverse brown spots just in front of eyes which are very pale violaceous; pronotum, scutellum, and tegmina stramineous; pronotum with four transverse brownish spots, two on anterior margin below inner margins of eyes, and two on disk, and a short transverse black line beneath the eyes; scutellum with three brownish spots on anterior margin and one before apex, all transverse; tegmina with the apical area subhyaline, the transverse veins, the apical margin, and a subapical spot, fuscous-brown; body beneath and legs ochraceous, face paler; head longer than broad between eyes, centrally moderately longitudinally depressed, the apex subacutely rounded; eyes large, obliquely directed backward, longer than broad; pronotum about as long as head, and twice as broad at base as long.

Length: 5 mm.

El-Meksa, south of El-Golea.

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XIV.  
ODONATA.

VON DR. F. RIS IN RHEINAU, SCHWEIZ.

1. **Calopteryx haemorrhoidalis** Vanderl.

1 ♂, Hammam R'hira, 31. v. 1911 (W. Rothsch. and E. Hartert).

2. **Ischnura Graellsii** Ramb.

1 ♂, See Fedzara, 21. v. 1909; 1 ♂, 2 ♀ ♀, El-Golea, 16. v. 1912.

Das ♂ von El-Golea zeigt einen sehr feinen weisslichen Saum am hinteren Rand des Prothorax, eine Eigenschaft, die sonst nicht *I. Graellsii* sondern der nahe verwandten *I. Genei* zukommt. Die Appendices dieses Exemplars sind stark gequetscht; doch glaube ich an den App. sup. bestimmt die *Graellsii*-Form zu erkennen.

3. **Agrion Lindeni** Selys.

1 ♂, See Fedzara, 21. v. 1909 (W. Rothsch. and E. Hartert).

4. **Mesogomphus Hageni** Selys.

1 ♂, Biskra, 24. ii.—16. iii.

Das unausgefärbte Exemplar stimmt in den Strukturmerkmalen mit vorliegenden ♂ von Abessinien und Südafrika überein.

5. **Hemianax ephippiger** Burm.

3 ♀ ♀, Hassi el Hadjar, 15. iii. 1912.

6. **Orthetrum anceps** Schneid.

1 ♀, Hammam R'hira, 25. v. 1911 (W. Rothsch. and E. Hartert).

7. **Orthetrum chrysostigma** Burm.

1 ♂, El-Golea, 26. iii. 1912.

8. **Trithemis annulata** Pal. de Beauv.

3 ♂ ♂, 1 ♀, In-Salah, Tidikelt, 15, 20. iv. 1912.

[Häufig in den Oasengärten.—E.H.]

9. **Selysiotthemis nigra** Vanderl.

1 ♂, El-Golea, 16. v. 1912.

Während die Arten unter 1–8 lange bekannte Vertreter der algerischen Fauna sind, bedeutet *S. nigra* einen ausserordentlich interessanten Zuwachs zu unserer Kenntnis dieser Fauna. Die Art wurde 1825 von Vander Linden beschrieben nach einem bei Terracina in Mittelitalien gefangenen adulten ♂; das Exemplar ist in der Sammlung Selys Longchamps (jetzt im Museum in Brüssel) noch vorhanden. Ein zweites ♂, unausgefärbt und damit von ziemlich verschiedenem Aussehen, erhielt de Selys aus Catalonien von Cuni y Martorel und beschrieb es 1878 als *Urothemis advena*. 1897 beschrieb der Verfasser aus dem Hamburger Museum eine Serie ♂ ♀ von Maralbachi in Chinesisch Turkestan und errichtete für die Art die Gattung *Selysiotthemis*. 1912 endlich erwähnt sie A. Bartenef von Afghanistan, Persien, dem



Amu Darja, Transkaspien und der Provinz Elisabetpol. Das sehr eigentümliche Colorit beider Geschlechter lässt sich vortrefflich mit ihrer Existenz in Sand- und Wüstengebieten vereinbaren. Der neue Fund der Art im Süden von Algerien lässt erwarten, dass ihre Existenz in Italien und Catalonien doch nicht von der östlichen Hauptverbreitung so völlig isoliert ist, wie es zunächst den Anschein hat. Es bleibt zu bedenken, dass im ganzen Mittelmeergebiet gerade solche Gegenden, wie sie dieser Art zuzusagen scheinen, doch noch sehr unvollständig auf Libellen durchforscht sind.

Die systematische Stellung von *Selysiotthemis* liegt weit ab von den palaearktischen Libellulinengattungen. Die nächsten Verwandten sind zweifellos die zwei Arten der Gattung *Macrodiplox* Brau., *cora* Brau. mit einer enorm weiten insulären und Küstenverbreitung am pacifischen und indischen Ocean, *balteata* Hag. mit einem sehr engen Küstenareal am Golf von Mexico, beide mit Verdacht auf Entwicklung in Brackwasser oder Salzwasser. Möglicherweise ist ein solcher Verdacht auch für *S. nigra* gerechtfertigt.

[Das Exemplar wurde am Rande des ganz rezenten, von dem Ueberfluss der artesischen Brunnen entstandenen Süßwassersees gefangen, doch befinden sich in der Nähe auch Brackwasserlachen, die im Sommer verdunsten.—E.H.]

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## CORRECTIONS TO No. VII. (LEPIDOPTERA).

BY THE HON. WALTER ROTHSCHILD, F.R.S., PH.D.

*Ocneria uniformis* mihi = *Cazama inotata* Walk.

*Bryophila incerta* mihi belongs to the genus *Iambiodes* Hmps., and must stand as *Iambiodes incerta* (Rothsch.).

*Eublemma sabulosa* mihi belongs to the *Acronychid* genus *Mudaria* Moore, and must stand as *Mudaria sabulosa* (Rothsch.).

The *Anumeta* called *A. henkei* (No. 77, p. 129) is a new subspecies, and is described below.

*Lymire lactealis* (No. 130) ♂ and *Enosima albicantalis* (No. 134) ♂ are ♂ and ♀ of one species, and must stand as *Lymire lactealis* Rothsch. The ♀ mentioned under *L. lactealis* is a new species, and will be described later.

*Anerastia majorella* mihi = *Anerastia ablutella* Zell.

*Constantia longidentalis* mihi = *Cludeobia chellatalis* Hmps.

*Constantia aridalis* mihi belongs to the genus *Aetenia*, and must stand as *Aetenia aridalis* (Rothsch.).

*Constantia dilutalis* mihi is a *Phycid* of the genus *Tephris*, and must stand as *Tephris dilutalis* (Rothsch.).

### ***Anumeta henkei harterti* subsp. nov.**

♂. Differs from *henkei henkei* by its sandy yellow not grey ground-colour and the sharper transverse lines in the forewings, in the almost complete absence of grey markings on the hindwings, and in the submarginal black line of the latter being almost obsolete.

Type ♂. S. of El-Golea, 12. v. 1912.

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## SOME UNFIGURED SYNTOMIDAE.

BY THE HON. W. ROTHSCHILD, PH.D., F.R.S.

## PLATE XIII.

Fig. 1.	<i>Cosmosoma rosenbergi</i> Rothsch.	.	.	Ann. Mag. vol. 5 (8).	p. 508
" 2.	" <i>flavithorax</i>	"	- -	" " "	p. 507
" 3.	" <i>intensa</i>	"	.	" " "	"
" 4.	" <i>crathidinum</i>	"	- -	Nov. Zool. vol. xviii.	p. 34
" 5.	" <i>watsoni</i>	"	.	Ann. Mag. vol. 5 (8).	p. 508
" 6.	" <i>buchwaldi</i>	"	- -	" " "	p. 509
" 7.	" <i>citrinum</i>	"	.	Nov. Zool. vol. xviii.	p. 34
" 8.	" <i>pulchrum</i> Rothsch. nom. nov.				
	for <i>C. rosenbergi</i>	-	-	No. 49	" " " p. 35
" 9.	<i>Cosmosoma parambae</i> Rothsch.	.	.	" " "	"
" 10.	" <i>chiriquensis</i>	"	- -	Ann. Mag. vol. 5 (8).	p. 508
" 11.	" <i>klagesi</i>	"	.	" " "	p. 509
" 12.	<i>Phaio unimacula</i>	"	- -	Nov. Zool. vol. xviii.	p. 39
" 13.	<i>Calonotos antennata</i>	"	.	" " "	"
" 14.	<i>Cosmosoma teuthras lignicolor</i> Rothsch.			" " "	p. 35
" 15.	<i>Euchromia brilliantina</i> Rothsch.	.	.	" " "	p. 38
" 16.	<i>Cosmosoma brasiliense</i>	"	- -	" " "	p. 36
" 17.	<i>Saurita watsoni</i>	"	.	" " "	p. 37
" 18.	<i>Chrysocale gigas</i>	"	- -	" " "	p. 39
" 19.	<i>Poliopasta rosenbergi</i>	"	.	" " "	p. 40
" 20.	<i>Cosmosoma teuthras nigrescens</i> Rothsch.			" " "	p. 35
" 21.	<i>Gymnelia ottonis</i> Rothsch. nom. nov.				
	for <i>baroni</i>	.	.	" " "	p. 28
" 22.	<i>Histixea hoffmannsi</i> Rothsch.	-	-	" " "	p. 39
" 23.	<i>Argyroeides flavicornis</i>	"	.	" " "	p. 42
" 24.	<i>Cosmosoma meridense</i>	"	- -	" " "	p. 36
" 25.	<i>Euchromia wahnesi</i>	"	.	" " "	p. 38
" 26.	<i>Calonotos opalizans</i>	"	- -	" " "	p. 40
" 27.	" <i>longipennis</i>	"	.	" " "	"
" 28.	<i>Poliopasta ockendeni</i>	"	- -	" " "	"
" 29.	<i>Mesolasia felderi</i>	"	.	" " "	p. 41
" 30.	<i>Trichura fasciata</i>	"	- -	" " "	"
" 31.	<i>Euchromia neglecta neglecta</i> Rothsch.	.	.	" " "	p. 38
" 32.	<i>Saurita cardinalis</i> Rothsch.	-	-	" " "	p. 37
" 33.	<i>Euchromia neglecta occidentalis</i> Rothsch.			" " "	p. 38
" 34.	<i>Eurota parishi</i> Rothsch.	-	-	" " "	p. 37
" 35.	<i>Dicladia vitrina</i>	"	.	" " "	"
" 36.	<i>Calonotos hoffmannsi</i>	"	- -	" " "	p. 40
" 37.	<i>Paraethria angustipennis</i>	"	.	" " "	p. 41
" 38.	" <i>flavosignata</i>	"	- -	" " "	"

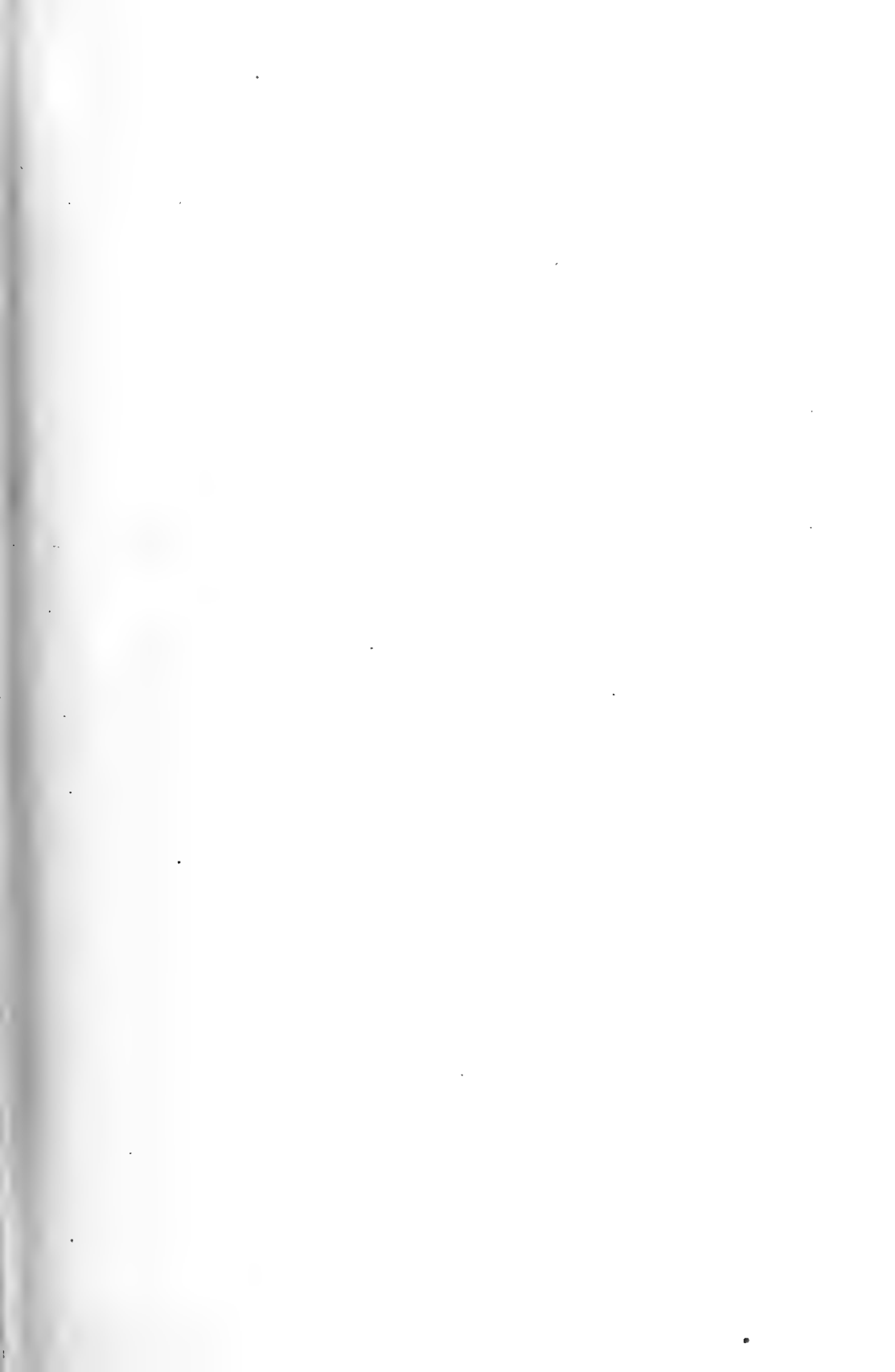
Fig. 39.	<i>Argyrocydes affinis</i>	Rothsch.	.	.	Nov. Zool. vol. xviii.	p. 41
" 40.	<i>Icharia bricenoi</i>	"	-	-	" "	p. 36
" 41.	<i>Psilopleura klagesi</i>	"	.	.	" "	"
" 42.	" <i>hymenopteridia</i>	Rothsch.	-	-	" "	"
" 43.	<i>Eurota baeri</i>	Rothsch.	.	.	" "	p. 37
" 44.	Hymenopteron mimicked by 42.					

## PLATE XIV

Fig. 1.	<i>Pseudosphecx klagesi</i>	Rothsch.	.	.	Nov. Zool. vol. xviii.	p. 24
" 2.	" <i>garleppi</i>	"	-	-	" "	"
" 3.	" <i>exsul</i>	"	.	.	" "	"
" 4.	" <i>steinbachi</i>	"	-	-	" "	"
" 5.	<i>Sphecosoma trinitatis</i>	"	.	.	" "	"
" 6.	Wasp mimicked by 5					
" 7.	<i>Sphecosoma aurantiipes</i>	"	-	-	" "	p. 25
" 8.	" <i>rufipes</i>	"	.	.	" "	"
" 9.	" <i>mathani</i>	"	-	-	" "	"
" 10.	<i>Isanthrene schausi</i>	"	.	.	" "	"
" 11.	" <i>drucei</i>	"	-	-	" "	p. 26
" 12.	<i>Sarosa boenninghauseni</i>	"	.	.	" "	p. 27
" 13.	" <i>klagesi</i>	"	-	-	" "	"
" 14.	<i>Gymnelia chimaera</i>	"	.	.	" "	"
" 15.	" <i>boettgeri</i>	"	-	-	" "	p. 28
" 16.	" <i>ockendeni</i>	"	.	.	Ann. Mag. vol. 5 (8).	p. 510
" 17.	" <i>doncasteri</i>	"	-	-	Nov. Zool. vol. xviii.	p. 28
" 18.	<i>Phoenicoprocta baeri</i>	"	.	.	" "	"
" 19.	" <i>steinbachi</i>	Rothsch.	-	-	" "	p. 29
" 20.	<i>Pheia costalis</i>	Rothsch.	.	.	" "	"
" 21.	<i>Loxophlebia klagesi</i>	"	-	-	" "	"
" 22.	" <i>rufescens</i>	"	.	.	" "	"
" 23.	<i>Isanthrene cajetani</i>	"	-	-	" "	p. 26
" 24.	" <i>tryphanei</i>	"	.	.	" "	"
" 25.	" <i>columbiana</i>	"	-	-	" "	"
" 26.	<i>Autochloris mathani</i>	"	.	.	" "	p. 27
" 27.	<i>Gymnelia pilosa</i>	"	-	-	Ann. Mag. vol. 5 (8).	p. 511
" 28.	" <i>baroni</i>	"	.	.	" "	p. 510
" 29.	<i>Cosmosoma brinkleyi</i>	"	-	-	Nov. Zool. vol. xviii.	p. 31
" 30.	" <i>garleppi</i>	"	.	.	" "	"
" 31.	" <i>oroyanum</i>	"	-	-	" "	"
" 32.	<i>Loxophlebia cosmosomoides</i>	Rothsch.	.	.	" "	p. 30
" 33.	" <i>semiflava</i>	Rothsch.	-	-	" "	"
" 34.	<i>Chrostosoma viridipunctatum</i>	Rothsch.	.	.	" "	"
" 35.	<i>Leucotomis felderi</i>	Rothsch.	-	-	" "	"
" 36.	<i>Chrostosoma schausi</i>	"	.	.	" "	"
" 37.	<i>Cosmosoma mathani</i>	"	-	-	" "	p. 31
" 38.	" <i>bricenoi</i>	"	.	.	" "	p. 32
" 39.	" <i>carabayanum</i>	"	-	-	" "	"

Fig. 40.	<i>Cosmosoma viridicingulatum</i>	Rothsch.	.	Nov. Zool. vol. xviii.	p. 32
" 41.	"	<i>baroni</i>	Rothsch.	- -	" " " "
" 42.	"	<i>flavicostale</i>	"	- -	" " " p. 33
" 43.	"	<i>steinbachi</i>	"	- -	" " " "
" 44.	"	<i>simillimum</i>	"	- -	" " " "
" 45.	"	<i>metallicum</i>	"	- -	" " " "
" 46.	"	<i>ichneumonoides</i>	Rothsch.	- -	" " " p. 34
" 47.	"	<i>stuarti</i>	♀ Rothsch.	- -	" " " "
" 48.	"	"	♂ " "	- -	" " " "
" 49.	"	<i>venatum</i>	"	- -	" " " "
" 50.	"	<i>dubium</i>	"	- -	" " " "
" 51.	"	<i>analicineta</i>	"	- -	Ann. Mag. vol. 5 (8). p. 509
" 52.	"	<i>ockendeni</i>	"	- -	" " " "
" 53.	"	<i>plagiata</i>	"	- -	" " " p. 510

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# NOVITATES ZOOLOGICAE.

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## LIST OF THE COLLECTIONS OF BIRDS MADE BY ALBERT S. MEEK IN THE LOWER RANGES OF THE SNOW MOUNTAINS, ON THE EILANDEN RIVER, AND ON MOUNT GOLIATH DURING THE YEARS 1910 AND 1911.

BY THE HON. WALTER ROTHSCHILD, F.R.S., PH.D., AND ERNST HARTERT, PH.D.

FOR several years we had in vain urged our indefatigable correspondent Albert S. Meek to make an attempt to collect in the Charles Louis or in the Snow Mountains (which form the eastern much higher continuation of the latter) in Dutch New Guinea, but not until 1909 did he declare himself to be willing to undertake this somewhat difficult expedition.

On May 1 Mr. Meek left Samarai for Port Moresby on his boat the "Shamrock," and on the 22nd reached Merauke, the new settlement on the south coast of Dutch New Guinea. From there he went along the coast in a Dutch patrol boat. The Dutch authorities, especially Mr. Hellwig, the Resident at Merauke, Mr. Kalf, Assistant-resident, Captain van der Bie, and later on Captain van der Ven, Captain Schaeffer, and other officers of the inland expeditions were exceedingly kind to Meek, and all our thanks are due to them.

Most of Meek's collections were made on the Setekwa River, a small tributary of the Oetakwa River, and at elevations from 2500 to 3000 ft., two and three days inland from "Canoe Camp," on the Oetakwa River. No attempt seems to have been made to reach greater heights of the Snow Mountains. In going up the river Mr. Meek had to depend entirely on the Bornean canoes belonging to the Dutch Military Expedition. In his book, *A Naturalist in Cannibal Land*, on pp. 215, 216, Mr. Meek writes: "On the way up from Canoe Camp my own boys had to do all the carrying, because it was impossible to enlist any help from the natives. The country through which we passed was of a limestone formation, very savage and inhospitable. The limestone came out in sharp ridges, and was full of holes and caverns, making the march slow, difficult, and painful. As a result of three days' hard work we got to a height of some 2500 ft., still in very inhospitable country, and among timid or semi-hostile natives. The weather was hot, and fever very bad in our camp. We found it impossible to get any native food, and so we had to do without vegetables. The only relief we had from the tinned food and rice which we carried with us was an occasional grilled pigeon."

Mr. Meek during his stay, besides the collection of birds, made very large collections of lepidoptera, containing numerous new species.

In December Mr. Meek had a cordial offer from the captain commanding the Eilanden River Expedition to join his forces. This offer was too good to be

refused, and Mr. Meek, in spite of his illness (apparently a kind of dropsy), left for the coast on December 16, 1910, and joined the Island River Expedition.

In his book, on pages 219-21, Meek writes about this journey as follows :—

“The Island River is a very fine stream, which, on nearing the coast, splits its great volume into branches, forming an extensive delta. It is possible to travel up the river by steamer 150 miles inland. When we had got that far by steamer we disembarked on to a hulk which had been moored there as a supply base for the expedition. At this hulk we repacked our stores, and went up by steam launch a further two days' journey. Then from this 'Launch Camp' we were carried by canoes for four days up the stream. The rapid character of the stream at this stage can be best judged from the fact that over a hundred rapids are encountered during the four days' journey, and that a distance which needs four days' hard travelling on the ascent can be covered within six hours in descending. The officers of the Dutch expedition were very hospitable to me, especially a naval officer, Captain van der Ven.

“At the 'Canoe Camp,' which marked the head of the navigable river, I started up towards the mountains again, using my own boys as carriers, as it was impossible to enlist any help from the natives around, who were very timid and not at all friendly. We journeyed four days into the interior, every day marking a great increase in elevation, for there were no foot-hills to be traversed. Finally I fixed a camp at the height of 6500 ft., or thereabouts, and sent the greater number of my boys back for more stores. Then I got the others to make a large clearing in the bush. Partly the purpose of this was to serve to attract moths at night; partly it was to make a more comfortable camping place for ourselves. The climate in this hill district is damp and miserable. When it is not raining one is liable to be soaked through and through by the great bodies of mist which come down from the mountain tops. The trees and shrubs drip constantly with wet. Insect life is abundant. It would thus have been impossible to have camped in any comfort without clearing away the forest and the undergrowth. I did not know that the clearing would have been so strongly resented by the natives of the district as it was; but had I known I should still have had to take the risk. Life there was particularly miserable. At night the cold was intense—a damp, moist cold like that during the worst of a London fog. By day the weather was, when not cold and damp, humid. Never was there a clear, bright air. The forest trees festooned with mosses, which hung from the branches down to the very ground; the soil covered with lichens, which gave a foothold such as a soaking-wet sponge would—these gave always an impression of damp unwholesomeness. It was rare to be dry. The earth was wet, the trees wet, the atmosphere dripping always. To add to our hardships, the food supply was necessarily poor. It was impossible to obtain any provisions locally. All that we ate had to be carried a four-days' march from the Canoe Camp.

“On the other hand, the collecting was simply glorious. The very first bird I shot was a new species of Bird of Paradise. I collected there also specimens of the most beautiful Bird of Paradise that I know—the *Astrapia splendidissima*.”

Unfortunately some of Mr. Meek's men contracted beri-beri, and the whole party was getting rather miserable and into a low state of health. Meek ascribed this to the want of any food except a small allowance of rice and tinned meat. Eventually one and later on two more of his natives died. Therefore he made no attempt to reach still greater heights, broke up camp, and descended to the coast.

In his book he writes : " On a previous expedition I had been forced by an outbreak of measles to go away from a fine collecting ground. I was now face to face again with a notice to quit. I had either to give up the work at a spot which was so promising of good results, or make my boys run the risk of death. The decision could only be in the one direction. I decided to start down for the coast." Afterwards, deploring the fate of his men, Mr. Meek writes : " I had become very fond of my boys after seeing them working by the side of the Malay coolies of the Dutch ; and the Dutch people, too, very greatly admired my boys from British New Guinea for their cheerfulness, endurance, and capacity for work. They reckoned they would sooner have fifty of my chaps than a couple of hundred of their own coolies."

As Mr. Meek touched partly entirely new ground and countries where not much collecting had been done, his birds were necessarily of the greatest importance for our knowledge of the avifauna of New Guinea. We described in the following pages and before, in the Bulletins of the British Ornithologists' Club and the *Ornithologische Monatsberichte*, not less than twenty-two new forms, while the collections also contained six of the new forms described shortly before Meek's expedition by Dr. van Oort, and at least three of the fourteen new forms so far named by Mr. Ogilvie-Grant, in the Bulletins vol. xxvii., xxix. and xxxi. of the British Ornithologists' Club. Large collections are, however, in the hands of Dr. van Oort, and we may shortly expect a valuable account of them in the Dutch work *Nova Guinea*, by Dr. van Oort. Mr. Ogilvie-Grant will, we hope, soon publish a full account of the collections made by the Goodfellow expedition and the more successful one of Dr. Wollaston, who succeeded in reaching the ice-cap of Carstenz Peak, in the Snow Mountains, so that our knowledge of the birds of these regions will soon be fairly good, though still far from absolutely " final."

The following are described by us as new from Mr. Meek's recent collections from Southern Dutch New Guinea : *Astur cirrhocephalus papuanus*, *Charmosynopsis multistriata*, *Charmosyna stellae goliathina*, *Nasiterna keiensis viridipectus*, *Aethomyias spilodera guttata*, *Poecilodryas albonotata griseiventris*, *P. leucops nigro-orbitalis*, *Machaerirhynchus nigripectus saturatus*, *Sericornis meeki*, *Androphilus viridis*, *Eupetes castanonotus saturatus*, *Pristorhampus versteri meeki*, *Philemon novaeguineae brevipennis*, *Melirrhophetes belfordi griseirostris*, *Melipotes gymnops goliathi*, *Pachycephala tenebrosa*, *Pachycare flavogrisea subaurantia*, *Falcinellus striatus atratus*, *Parotia carolae meeki*, *Paradigalla brevicauda*, *Pitohui meeki*.

Besides these, Mr. Meek collected such rare birds as *Pteridophora alberti*, *Loboparadisea sericea*, *Chaetura novaeguineae*, of which only the type specimen from the Fly River had been known, a second example of *Melopitta gigantea*, *Malurus lorentzi*, *Chytomyia insignis oorti*, and many other rare and particularly interesting birds.

Zoogeographically the collection is very interesting, the birds being, apart from the peculiar forms, partly those of North-western New Guinea, and partly the same which occur in the mountains of South-eastern New Guinea. Mount Goliath has perhaps more representatives of the north-western fauna. The latter mountain and the lower ranges of the Snow Mountains have not in all cases the same fauna, as the list of the collections will show.

Besides the birds, Mr. Meek collected, as usual, a wonderful lot of lepidoptera, among which are hundreds of new species, but hitherto only eighty-two *Arctiidae*,

some new species of the genus *Delias*, some *Geometridae* and *Noctuidae* have been described.

Our thanks are due to Dr. Gestro of Genoa and Dr. van Oort of Leiden for information about types and loan of specimens for comparison.

Neither the "Eilanden-rivier" (Islands River) nor Mount Goliath is found in atlases. The first mention of the discovery of that mountain appears to be in the *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap*, xxviii. (1911), No. 1, pp. 124 and 321. The Goliath lies thus somewhat between the Wilhelmina-top (4700 m.) and the Juliana-top (4500 m.); cf. map No. XXI. in the above-named Dutch periodical, xxvii. (1910). A general good map of Dutch New Guinea is also map XVII. in vol. xxv. (1908) of the same journal. The Eilanden River is south of the Noord—or Lorentz—River, between the 5th and 6th degree of southern latitude. For correct maps of the Eilanden River and Goliath Mountain see recent volumes of the *Tijdschr. K. Nederl. Aardr. Genootschap*.

✓ 1. *Casuarus casuarus sclaterii* Salvad.

*Casuarus sclaterii* Salvadori, *Ann. Mus. Civ. Genova* xii. 1878. p. 422; van Oort, *Nova Guinea* ix. Zool., livr. 1. p. 51.

The skull of an adult bird was sent from the Setekwa River.

✓ 2. *Casuarus claudii* Ogilvie-Grant.

*Bull. B. O. Club* xxix. p. 25 (Swaka River, 4000—5000 ft.).

The head of an adult bird from the Snow Mountains, November 1, 1910.

✓ 3. *Talegallus cuvieri* Less. (? subspecies).

*Talegallus cuvieri* Lesson, *Voy. Coquille*, Zool., Atlas, pl. 38 (1826—Dorey).

♂ ad.; Snow Mountains, 5. viii. 1910. (No. 4581, A. S. Meek Coll.)

"Feet orange yellow; bill brown and yellow."

Two young in different stages, Snow Mountains. (Nos. 4737, 4745.)

This specimen agrees entirely with our examples from North-Western New Guinea, except that it is larger.

✓ 4. *Talegallus fuscirostris* Salvad.

*Talegallus fuscirostris* Salvadori, *Ann. Mus. Civ. Genova* ix. pp. 332. 334 (1877—S. New Guinea and Aru Islands).

*Talegallus cuvieri fuscirostris*, *Nor. Zool.* 1901. p. 139; van Oort, *Nova Guinea* ix. i. p. 57.

♂ ♀; Upper Setekwa River, 15. viii., 16. xi. 1910. (Nos. 4517, 5005, A. S. Meek Coll.)

"Iris dark brown; bill vandyke brown (and black); feet chrome yellow (and lemon yellow)."

These birds differ from *T. cuvieri* in having blackish bills, and the feathers do not reach to the tibio-tarsal joint, but leave over a centimetre bare. Our treatment of *T. cuvieri* and *fuscirostris* as subspecies (*Nor. Zool.* 1901, p. 139) is perhaps not correct, in view of their occurrence close together and perhaps side by side.

✓ 5. **Aepyodius arfakianus** (Salvad.).

*Talegallus arfakianus* Salvadori, *Ann. Mus. Civ. Genova* ix. pp. 333, 334 (1877—Chicks from Arfak); cf. *Cat. B. Brit. Mus.* xxii. p. 470; *Nov. Zool.* 1901. p. 140.

♀ (or ♂ juv.); Snow Mountains, 2000 ft., 24. ix. 1910. (No. 4726, A. S. Meek Coll.)

“Iris grey; bill: upper, brown; lower, pale green; throat pale blue; feet sage-green.”

✓ 6. **Megapodius duperreyi duperreyi** Less. & Garn.

*Megapodius Duperreyi* Bull. Sc. Nat. viii. p. 113 (1826—Dorey); cf. *Nov. Zool.* 1901. p. 135.

♀ ad.; Lower Setekwa River, 24. xi. 1910. (No. 5033, A. S. Meek Coll.)

“Iris brown; feet salmon-red; bill brown.”

♀ ad.; Eilanden River, 8. xii. 1910. (No. 5050, A. S. Meek Coll.)

“Iris brown; feet red and brown; bill brown.”

These two specimens are rather short-winged, but the quills are not fully grown.

Pullus, Upper Setekwa River, 13. viii. 1910.

✓ 7. **Ptilinopus superbus** (Temm.).

Cf. *Nov. Zool.* 1901. p. 448; van Oort, *Nova Guinea* ix. i. p. 65.

*Columba superba* Temminck and Knip, *Pigeons*, p. 75. pl. 33 (1808-11—Tahiti: errore. We accept as terra typica: N.W. New Guinea).

3 ♂; Upper Eilanden River, March 1911. (Nos. 5487, 5488, 5503, A. S. Meek Coll.)

♂; Snow Mountains, 2000 ft., 31. viii. 1910.

✓ 8. **Ptilinopus pulchellus** (Temm.).

Cf. *Nov. Zool.* 1901. p. 448; van Oort, *Nova Guinea* ix. i. p. 64.

*Columba pulchella* Temminck, *Pl. Col.* 564 (1835—Lobo Bay, New Guinea).

2 ♂; Snow Mountains, 24, 30. ix. 1910. (Nos. 4725, 4759, A. S. Meek Coll.)

4 ♂ ♀; Upper Setekwa River, July and August 1910. (Nos. 4482, 4503, 4491, 4310, A. S. Meek Coll.)

♂ ♀; Upper Eilanden River, 6. iii. 1911. (Nos. 5491, 5492, A. S. Meek Coll.)

♀ ad.; Eilanden River, 10. xii. 1910. (No. 3060, A. S. Meek Coll.)

9. **Ptilinopus coronulatus coronulatus** Gray.

*Ptilinopus coronulatus* Gray, *P. Z. S.* 1858. pp. 158, 195. pl. 138 (Aru Islands); cf. *Nov. Zool.* 1901. p. 102.

2 ♀ ad.; Lower Setekwa River, 19, 21. xi. 1910. (Nos. 5013, 5026, A. S. Meek Coll.)

♂ ad.; Eilanden River, 13. xii. 1910. (No. 5068, A. S. Meek Coll.)

✓ 10. **Ptilinopus rivolii bellus** Scl.

*Ptilinopus bellus* Sclater, *P. Z. S.* 1873. pp. 696, 698. pl. 57 (Arfak Mountains).

4 ♂, 1 ♀; Mt. Goliath, January 1911. (Nos. 5219, 5242, 5258, 5376, 5377, A. S. Meek Coll.)

4 ♂ 2 ♀; Snow Mountains, August 1910. (Nos. 4580, 4584, 4585, 4621, 4683, 4860, A. S. Meek Coll.)

✓ 11. *Ptilinopus gestroi* Salvadori & d'Alb.

*Ptilinopus gestroi* Salvadori and d'Alberis, *Ann. Mus. Civ. Genova* vii. p. 834 (1875—Yule Island); cf. *Nov. Zool.* 1901. p. 105.

14 ♂, 6 ♀; Mt. Goliath, January and February 1911. (Nos. 5109, 5110, 5117, 5140, 5141, 5156, 5261, 5342, 5358, 5380, 5399, 5410, 5411, 5422, 5459, 5460, 5461, 5464, 5465, 5466, A. S. Meek Coll.)

Some of these specimens are as highly coloured as *P. gestroi kaporensis* (*Nov. Zool.* 1901, p. 105), and we now believe that our supposed *kaporensis* is only a very highly coloured old male.

12. *Ptilinopus perlatus zonurus* Salvad.

*Ptilinopus zonurus* Salvadori, *Ann. Mus. Civ. Genova* ix. p. 197 (1876—Aru Islands); cf. *Nov. Zool.* 1901. p. 106; van Oort, *Nova Guinea* ix. i. p. 65.

♀; Snow Mountains, 2000 ft., 12. x. 1910. (No. 4825, A. S. Meek Coll.)  
“ Iris yellow; bill pale green; feet purple.”

✓ 13. *Carpophaga rufigaster* (Quoy & Gaim.).

*Columba rufigaster* Quoy et Gaimard, *Voy. Astrolabe* p. 245 pl. 27 (1830—Terra typica: Dorey); cf. *Nov. Zool.* 1901. p. 113; van Oort, *Nova Guinea* ix. i. p. 67.  
(*Carpophaga rufiventris* Salvadori).

♂; Setekwa River, 19. xi. 1910. (No. 5014, A. S. Meek Coll.)  
♀; Snow Mountains, 4. x. 1910. (No. 4775, A. S. Meek Coll.)  
♂ ♀; Eilanden River, xii. 1910. (Nos. 5076, 5083, A. S. Meek Coll.)  
1 ad.; Upper Eilanden River, 3. iii. 1911. (No. 5473, A. S. Meek Coll.)

✓ 14. *Carpophaga chalconota* Salvad.

*Carpophaga chalconota* Salvadori, *Ann. Mus. Civ. Genova* vi. p. 87 (1874—Hatam, N.W. New Guinea); cf. *Nov. Zool.* 1901. p. 113.

3 ♂ ♀; Mt. Goliath, February 1911. (Nos. 5307, 5378, 5418, A. S. Meek Coll.)

15. *Carpophaga mülleri mülleri* (Temm.).

*Columba Müllerii* Temminck, *Pl. Col.* 566 (1835—Dourga River, Southern New Guinea). Cf. *Nov. Zool.* 1901. p. 115; van Oort, *Nova Guinea* ix. i. p. 66.

2 ♀; Lower Setekwa River, November 1910. (Nos. 5015, 5030, A. S. Meek Coll.)

“ Iris light brown; bill black; feet pale purple.”

♂; Eilanden River, 6. xii. 1919. (No. 5048, A. S. Meek Coll.)

16. *Carpophaga pinon pinon* (Quoy & Gaim.).

*Columba Pinon* Quoy et Gaimard, *Voy. Uranie*, *Zool.* p. 118. pl. 28 (1824—Rawak); cf. *Nov. Zool.* 1901. p. 114; van Oort, *Nova Guinea* ix. i. p. 67.

3 ♂ ♀; Setekwa River, November and August 1910. (Nos. 4506, 5031, 5040, A. S. Meek Coll.)

“ Iris bright red; bill slaty blue; feet purplish red.”

17. *Carpophaga zoeae* (Less.).

*Columba zoeae* Lesson, *Voy. Coquille*, *Zool. Atlas* pl. 39 (1826—Dorey, Arfak); cf. *Nov. Zool.* 1901. p. 112; van Oort, *Nova Guinea* ix. i. p. 66.

♂; Lower Setekwa River, 26 xi. 1910. (No. 5041, A. S. Meek Coll.)

18. *Megaloprepia magnifica puella* (Less.).

*Columba puella* Lesson, *Bull. Univ. Sc. Nat.* x. p. 400 (1827—Port Praslin and Dorey. *Terra typica* solely Dorey; cf. Salvadori, *Orn. Pap.* iii. p. 66; *Nov. Zool.* 1901. p. 110; van Oort, *Nova Guinea* ix. i. p. 66.

4 ♂, 2 ♀; Setekwa River, July and August 1910. (Nos. 4212, 4225, 4228, 4256, 4303, 4511, A. S. Meek Coll.)

1 ad. Upper Eilanden River, 3.iii.1911. (No. 5475, A. S. Meek Coll.)

“Iris yellow; bill greenish yellow.”

The specimen from the Eilanden River has rather larger yellow wing-spots than the majority of examples from Arfak, and also those from the Setekwa River have an inclination for larger spots. They agree, however, with *puella* in the bright yellow belly (which is greenish yellow in *poliura*) and in the blackish rectrices. In the Eilanden River bird the central rectrices are glossed with blue.

✓ 19. *Columba (Gymnophaps) albertisii* (Salvad.).

*Gymnophaps albertisii* Salvadori, *Ann. Mus. Civ. Genova* vi. p. 86 (1874—Andai, N.W. New Guinea); *Nov. Zool.* 1901. p. 117, 1907. p. 449; van Oort, *Nova Guinea* ix. i. p. 64.

3 ♂ ♀; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5131, 5151, 5423, A. S. Meek Coll.)

20. *Columba albigularis* (Bp.).

*Janthoenas albigularis* Bonaparte, *Compt. Rend.* xxxix. p. 1105 (1854—Gilolo); *Nov. Zool.* 1901, p. 118.

♂ ad. Snow Mountains, 3000 ft., 26. x. 1910. (No. 4904, A. S. Meek Coll.)

✓ 21. *Macropygia amboinensis cinereiceps* Tristr.

*Macropygia cinereiceps* Tristram, *Ibis* 1889. p. 558 (D'Entrecasteaux Islands); cf. *Nov. Zool.* iii. p. 249, viii. p. 125; van Oort, *Nova Guinea* ix. i. p. 63.

2 ad.; Upper Setekwa River, August 1910. (Nos. 4473, 4493, A. S. Meek Coll.)

3 ad., 1 juv.; Snow Mountains, 2000—3000 ft., August and October 1910. (Nos. 4631, 4809, 4851, 4898, A. S. Meek Coll.)

2 ad., 1 juv.; Mt. Goliath, February and January 1911. (Nos. 5240, 5324, 5393, A. S. Meek Coll.)

This form is very closely allied to *M. amboinensis doreya* (see *Nov. Zool.* viii. p. 122), and differs only from the latter in the lesser amount of blackish barring on the chest, which is often indistinct and even quite absent, but some specimens are not easily separable, while a series shows the distinctness very clearly.

✓ 22. *Macropygia nigrirostris* Salvad.

*Macropygia nigrirostris* Salvadori, *Ann. Mus. Civ. Genova* vii. p. 972 (1875—Arfak and Warbusi); cf. *Nov. Zool.* 1901. p. 126.

2 ♀ ad., juv.; Snow Mountains, 2000 and 2500 ft., August 1910. (Nos. 4589, 4590, A. S. Meek Coll.)

1 ♂ ad.; Mt. Goliath, 29. i. 1911. (No. 5239, A. S. Meek Coll.)

“Iris dull yellow, feet chinese red, bill black,” in the adult birds.

✓ 23. **Reinwardtoenas reinwardtsi griseotincta** Hart.

*R. reinwardtsi griseotincta* Hartert, *Nov. Zool.* iii. p. 18 (1896—Papua; type Mailu district, British New Guinea); cf. van Oort, *Nova Guinea* ix. 1. p. 64.

4 ad.; Snow Mountains, 2500 ft., August to October 1910. (Nos. 4592, 4583, 4755, 4839, A. S. Meek Coll.)

1 ♀ ad., 2 juv.; Upper Setekwa River, July and August 1910. (Nos. 4275, 4341, 4516, A. S. Meek Coll.)

Adult: "Iris red; feet purplish red; bill brown, purplish red at base."

Young: "Iris brown; bill vandyke brown; feet black and reddish brown."

The young is dirty brown above and below.

24. **Chalcophaps stephani** Pucher. & Jacq.

*Chalcophaps stephani* Pucheran and Jacquinet, *Voy. Pôle Sud*, *Zool.* iii. p. 119 (1853—West coast of New Guinea); *Nov. Zool.* 1901. p. 129.

1 ad., 1 juv.; Lower Setekwa River, November 1910. (Nos. 5017, 5032, A. S. Meek Coll.)

1 ♂ ad.; Eilanden River, 12. xii. 1910. (No. 5067, A. S. Meek Coll.)

✓ 25. **Henicophaps albifrons** Gray.

*Henicophaps albifrons* Gray, *P.Z.S.* 1861. pp. 432, 437, pl. 44 (Waigiu\*); cf. *Nov. Zool.* 1901. p. 130; van Oort, *Nova Guinea* ix. i. p. 62.

♂ ♀; Lower Setekwa River, 26. xi. 1910. (Nos. 5039, 5046, A. S. Meek Coll.)

2 ♂; Upper Setekwa River, 5. vii., 15. ix. 1910. (Nos. 4279, 4544, A. S. Meek Coll.)

♀ ad.; Snow Mountains, 2000 ft., 28. ix. 1910. (No. 4747, A. S. Meek Coll.)

♂ ad.; Eilanden River, 11. xii. 1910. (No. 5062, A. S. Meek Coll.)

♂ juv. Mt. Goliath, 3. ii. 1911. (No. 5286, A. S. Meek Coll.)

✓ 26. **Trugon terrestris leucoporeia** (A. B. Meyer).

*Entrugon leucoporeia* A. B. Meyer, *Zeitschr. ges. Orn.* 1886. p. 29 (Astrolabe Mountains); *Nov. Zool.* 1901. p. 132.

♀; Lower Setekwa River, 27. xi. 1910. (No. 5044, A. S. Meek Coll.)

1 ♂, 2 ♀; Upper Setekwa River, July and November 1910. (Nos. 4447, 4549, 4978, A. S. Meek Coll.)

♀; Snow Mountains, 2000 ft., 30. ix. 1910. (No. 4761, A. S. Meek Coll.)

✓ 27. **Phlegoenas beccarii** (Salvad.).

*Chalcophaps beccarii* Salvadori, *Ann. Mus. Civ. Genova* vii. p. 974 (1875—Hatam); cf. remark in *Nov. Zool.* 1901. p. 131.

1 juv.; Snow Mountains, 2500 ft., 11. viii. 1910. (No. 4594, A. S. Meek Coll.)

\* In the *Cat. B. Brit. Mus.* xxi. p. 525 a specimen from "New Guinea" is said to be the type, but it is evidently labelled erroneously, because in the original description Waigiu is given as the terra typica.



✓ 28. *Phlegoenas rufigula* Bp.

*Phlegoenas rufigula* Bonaparte, *Consp. Av.* ii, p. 89 (1854—"Nova Guinaea").

[It seems to be impossible to find out when the text of Reichenbach's "Tauben" appeared, because the author quotes Bonaparte's *Consp. Av.* ii., which is supposed to have appeared in 1854, and Bonaparte quotes Reichenbach, which is supposed to have appeared in 1862. The plate of Reichenbach **without name** is said to have appeared in 1851. Reichenbach correctly described *P. crinigera* and *rufigula*, but the numbers of the figures on plate 259 were erroneously reversed.]

Cf. van Oort, *Nova Guinea* ix. i. p. 62.

1 ad., 1 juv. ; Upper Setekwa River, August and November 1910. (Nos. 4523, 4550, A. S. Meek Coll.)

♂ ad. ; Lower Setekwa River, 24. xi. 1910. (No. 5034, A. S. Meek Coll.)

♂ fere ad. ; Snow Mountains, 2000 ft., 7. x. 1910. (No. 4787, A. S. Meek Coll.)

" Iris dark brown ; feet dark purplish red ; bill brownish horn-colour " in the adult birds.

Our two adult birds show no sign of the grey band on the sides of the crown and occiput, while the younger birds show it very distinctly. This goes to prove, in our opinion, that "*helviventris*" Rosenb. is at least a very doubtful form, though the identity of the two forms can only be proved by finding specimens with the grey band on the Arn Islands.

✓ 29. *Otidiphaps nobilis* Gould.

✓ *Otidiphaps nobilis* Gould, *Ann. & Mag. Nat. Hist.* (4) v. p. 62 (1870—New Guinea). Type in the British Museum) : cf. *Nov. Zool.* 1901. p. 132 ; van Oort, *Nova Guinea*, ix. i. p. 62.

2 ♂ ; Upper Setekwa River, July 1910. (Nos. 4239, 4290.)

1 ♂ ; Snow Mountains, 2000 ft., 30. ix. 1910. (No. 4760.)

" Iris bright red ; feet yellow, black and purple ; bill red."

✓ 30. *Gymnocrex plumbeiventris* (Gray).

*Rallus plumbeiventris* Gray, *P. Z. S.* 1861. pp. 432, 438 ("Mysol." In the original description "Mysol" is expressly stated as the locality of the type, while in the *Cat. B. Brit. Mus.* xxiii. "Morotai" is given as its locality !)

♂ not quite adult ; Setekwa River, 22. vi. 1910. (No. 4216, A. S. Meek Coll.)

" Iris light brown ; bill dark brown ; feet brick-red."

The head of this specimen is rather darker and browner, and in contrast with the dark chestnut hindneck, but this is apparently due to immaturity.

31. *Dendrocycna guttulata* Wall.

*Dendrocycna guttulata* Wallace, *P. Z. S.* 1863. p. 36 (Buru, Ceram, Celebes).

*Dendrocycna guttulata* van Oort, *Nova Guinea*, ix. i. p. 55.

♀ ad. ; Eilanden River, 17. xii. 1910. (No. 5077, A. S. Meek Coll.)

" Iris chocolate ; feet black, legs brown ; bill dark brown."

32. *Dupetor flavicollis gouldi* (Bp.).

See *Nov. Zool.* 1908. p. 354 : van Oort, *Nova Guinea*, ix. i. p. 54.

♂ juv. ; Eilanden River, 19. xii. 1910. (No. 5078, A. S. Meek Coll.)

" Iris light yellow ; bill dark brown ; under-mandible light brown ; feet light brown."

33. *Erolia maculata acuminata* (Horsf.).

*Totanus acuminatus* Horsfield, *Trans. Linn. Soc. Lond.* xiii. p. 192 (1821—Java).

♀ ; Upper Setekwa River, 9. xi. 1910. (No. 4962, A. S. Meek Coll.)

✓ 34. *Tringa hypoleuca* L.

*Tringa Hypoleucus* Linnaeus, *Syst. Nat.* i. p. 149 (1758—Europe. Restricted terra typica: Sweden).

3 ♂, 1 ♀ ; Upper Setekwa River, November 1910. (No. 4961, 4966, 4967, 4985, A. S. Meek Coll.)

1 ♂ ; Eilanden River, 8. xii. 1910. (No. 5049, A. S. Meek Coll.)

35. *Charadrius dubius* Scop.

*Charadrius dubius* Scopoli, *Del. Faun. et Flor. Insubr.*, ii. p. 93 (1786—Luzon).

2 ♂ ad. ; Upper Setekwa River, August and September 1910. (Nos. 4471, 4534, A. S. Meek Coll.)

✓ 36. *Astur melanochlamys schistacinus* subsp. nov.

Differs from *A. melanochlamys melanochlamys* from N.W. New Guinea (Arfak) by the black of the upperside, including wings and tail, having a decided greyish wash or bloom, so that, instead of being glossy black, the upper surface is slaty black, and the collar, and especially the underside, is distinctly paler, more cinnamon-chestnut than rufous-chestnut.

Wing: ♂ 213, ♀ 250; tail: ♂ 168, ♀ 207 mm.

“ Iris reddish yellow; bill black; feet bright yellow.”

Type: ♀ ad., Mt. Goliath, 2. ii. 1911. (No. 5278, A. S. Meek Coll.)

Besides this specimen we have a female from Owgarra, Angabunga River, collected by A. S. Meek, 13. xi. 1904. This specimen was not mentioned in our paper on the birds from the Angabunga River.

37. *Astur cirrhocephalus papuanus* subsp. nov.

Differs from *A. cirrhocephalus cirrhocephalus* from Australia in being clearer, dark bluish slate (instead of paler greyish, washed with brown) on the upperside, and brighter rufescent with generally much less distinct whitish bars on the under surface. The bars, and more or less the whole underside in the males, have a distinct plum-like bloom, the transverse bars being more lavender than white. The feathering of the thighs and tibiae is bright rufous, with bare indications of bars.

♂ : “ Iris orange yellow; bill black; cere slaty-blue; feet orange-yellow.”

♀ : “ Iris bright lemon-yellow; bill black; cere pale blue; feet saffron-yellow.”

Type: ♀ ad.; Snow Mountains, 23. x. 1910. (No. 4883, A. S. Meek Coll.)

Besides the type we have the following specimens of this new form:

♂ ad.; Avera, Aroa River, 31. i. 1903. (No. A 168, A. S. Meek Coll.)

♂ ; Milne Bay, 14. ii. 1899. (No. 2307, A. S. Meek Coll.)

♀ ; Sattelberg, December. (C. Wahnes Coll.)

♂ ; Mt. Victoria, British New Guinea, 1895.

In the two males from Avera and Milne Bay the rufous nuchal collar is complete and somewhat bright chestnut, while in the other three specimens it is incomplete and variable.

✓ 38. *Baza subcristata reinwardtii* (Müll. & Schleg.).

*Falco (Lophotes) Reinwardtii* Müller & Schlegel, *Verh. Nederl. Overz. Bezitt. Zool.*, Aves, p. 35. pl. 5. fig. 2 (1839-44—"Celebes, Borneo." Errone. Patria substituta: Amboina!)

*Baza subcristata megala* > *reinwardtii*, *megala* < *reinwardtii* Stresemann, *Nov. Zool.* xx. p. 307.

*Baza reinwardtii stenozona* van Oort, *Nova Guinea*, ix. Zool. i. p. 56.

2 ♂, 2 ♀ ad.; Upper Setekwa River, July, September, November 1910. (Nos. 4377, 4378, 4531, 4982, A. S. Meek Coll.)

We do not find the alleged differences of *B. r. stenozona* constant, and cannot separate the latter from *B. s. reinwardtii*. We consider the birds from New Guinea to be inseparable from those from the Southern Moluccas. It is true that they point somewhat to the large Fergusson-form, but on the whole they agree with *reinwardtii*. The wings of the present specimens measure 294, 299, 303, 307 mm. It is desirable to compare more specimens from Fergusson, in order to confirm the apparently very distinct form *B. s. megala*.

✓ 39. *Henicopernis longicauda* (Garn.).

*Falco longicaudus* Garn., *Voy. Coqu.*, Zool. i. p. 588. pl. 10 (1828—Dorey).

♀; Snow Mountains, 2000 ft., 14. x. 1910.

"Iris bright lemon-yellow; feet chalky-white; bill flesh-colour."

✓ 40. *Chalcopsittacus scintillatus chloropterus* Salvad.

*Chalcopsittacus chloropterus* Salvadori, *Ann. Mus. Civ. Genova* ix. p. 15 (1876—Hall Bay, British New Guinea); cf. Salvadori, *Orn. Pap.* i. p. 276; *Nov. Zool.* 1901. p. 65; van Oort, *Nova Guinea* ix., Zool. i., p. 73.

♀; Upper Eilanden River, 4. iii. 1911. (No. 5477, A. S. Meek Coll.)

"Iris reddish brown; bill and feet black."

Dr. van Oort (*Nova Guinea* ix., Zool. livr. i. p. 73) makes some interesting remarks, from which it appears that *C. s. scintillatus* and *chloropterus* occur in the same locality. Further researches are desirable to definitely establish the status of these two forms.

✓ 41. *Chalcopsittacus scintillatus scintillatus* (Temm.).

*Psittacus scintillatus* Temminck, *Pl. Col.* 569 (1835—Lobo Bay); cf. *Nov. Zool.* 1901. p. 64.

4 ♂ ad. and jun.; Setekwa River, June 1910. (Nos. 4222, 4223, 4224, 4232, A. S. Meek Coll.)

♂ juv.; Upper Setekwa River, 7. vii. 1910. (No. 4305, A. S. Meek Coll.)

42. *Eos fuscata* Blyth.

*Eos fuscatus* Blyth, *Journ. As. Soc. Bengal* xxvii. p. 279 (1858—Habitat unknown); cf. *Nov. Zool.* 1901. p. 65.

♂; Upper Setekwa River, 12. xi. 1910. (No. 4979.) (Red "phase.")

3 ♂, 2 ♀; Snow Mountains, 3000 ft., October, November 1910. (Nos. 4866, 4916, 4954, 4955, 4956, A. S. Meek Coll.) (All of the red "phase.")

7 ♂, 2 ♀; Mt. Goliath, January and February 1911. (Nos. 5205, 5245, 5287, 5288, 5289, 5311, 5348, 5312, 5458, A. S. Meek Coll.) (Six red "phase," one intermediate, two yellow "phase.")

✓ 43. *Lorius lory erythrothorax* Salvad.

*Lorius erythrothorax* Salvadori, *Ann. Mus. Civ. Genova* x. p. 32 (1877—Mount Epa in S.E. New Guinea); cf. *Nov. Zool.* 1901. p. 66; van Oort, *Nova Guinea* ix. i. p. 74.

2 ♂ ad., 1 ♂ juv., 1 ♀; Upper Setekwa River, July 1910. (Nos. 4241, 4250, 4251, 4295, A. S. Meek Coll.)

3 ♂, 1 ♀; Snow Mountains, 2500 ft., July, August, October 1910. (Nos. 4555, 4651, 4642, 4833, A. S. Meek Coll.)

44. *Trichoglossus haematodus cyanogrammus* Wagl.

*Trichoglossus cyanogrammus* Wagler, *Mon. Psittac.* p. 554 (1835—Habitat in Amboina. Locality taken from Brisson, *Av.* iv. p. 364); cf. *Nov. Zool.* 1901. p. 69; van Oort, *Nova Guinea* ix. i. p. 75.

♂ ♀; Upper Setekwa River, July and August 1910. (Nos. 4436, 4472, A. S. Meek Coll.)

2 ♂, 2 ♀; Snow Mountains, 2000 ft., September and October 1910. (Nos. 4756, 4764, 4765, 4827, A. S. Meek Coll.)

✓ 45. *Glossopsittacus goldiei* (Sharpe).

*Trichoglossus goldiei* Sharpe, *Journ. Linn. Soc.*, Zool. xvi. pp. 318, 426 (1882—Astrolabe Mountains); cf. *Nov. Zool.* 1901. p. 71.

2 ♂, 3 ♀; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5111, 5218, 5274, 5226, 5391, A. S. Meek Coll.)

✓ 46. *Charmosynopsis multistriata* Rothsch.

*Charmosynopsis multistriata* Rothschild, *Bull. B.O. Club* xxvii. p. 45 (1911—"Oetakwa River").

♂ ad.; Upper Setekwa River, 2. vii. 1910. (No. 4252, A. S. Meek Coll.)

♂; Snow Mountains, 2000 ft., 12. x. 1910. (No. 4821, A. S. Meek Coll.)

✓ 47. *Charmosynopsis pulchella* (Gray).

*Charmosyna pulchella* Gray, *List Psitt. Brit. Mus.* p. 102 (1859—Dorey); cf. *Nov. Zool.* 1901. p. 72.

♂ ♀ jun.; Upper Setekwa River 2. vii. 1910. (Nos. 4248, 4249, A. S. Meek Coll.)

2 ♂ ad., 2 ♀ ad., 1 ♂ jun.; Snow Mountains, 2000 ft., July 1910. (Nos. 4664, 4667, 4668, 4671, 4676, A. S. Meek Coll.)

4 ♂ ad., 3 ♀ ad., 1 ♂ juv., 2 ♀ juv.; Mt. Goliath, January and February 1911. (Nos. 5144, 5207, 5228, 5339, 5388, 5308, 5429, 5408, 5437, 5429, A. S. Meek Coll.)

✓ 48. *Charmosyna josephinae* (Finsch).

*Trichoglossus Josephinae* Finsch, *Atti Soc. Ital. Sc. Nat.* xv. p. 427. pl. 7 (1873—Arfak).  
*Charmosyna josephinae* van Oort, *Nova Guinea* ix. i. p. 75.

♂ juv.; Upper Setekwa River 1. vii. 1910. (No. 4237, A. S. Meek Coll.)

1 ♂ ad., 3 ♀ ad., 3 ♂ jun.; Snow Mountains, 2000 ft., July and October 1910. (Nos. 4654, 4661, 4662, 4622, 4788, 4789, 4910, A. S. Meek Coll.)

Ad.: "Iris yellowish red; bill red; feet orange yellow."

✓ 49. *Charmosyna stellae goliathina* Rothsch. & Hart.

*Charmosyna stellae goliathina* Rothschild and Hartert, *Nov. Zool.* 1911. p. 16 (Mt. Goliath).

4 ♂, 5 ♀; Mt. Goliath, January and February 1911. (Nos. 4204, 5146, 5211, 5266, 5279, 5284, 5384, 5392, 5426, A. S. Meek Coll.)

2 ♂; Snow Mountains, 2000 ft., 20. viii. 1910. (Nos. 4653, 4659, A. S. Meek Coll.)

“Iris salmon-red; bill red; feet orange-yellow.”

Differs from *C. stellae stellae* in both sexes by having the longer upper tail-coverts dull green instead of red.

✓ 50. *Charmosyna atrata* Rothsch.

*Charmosyna atrata* Rothschild, *Bull. B. O. Club* vii. p. liv (1898—Mt. Scratchley, British New Guinea).

♂; Mt. Goliath, 5000 ft., 14. i. 1911. (No. 5121, A. S. Meek Coll.)

♂ juv.; Mt. Goliath 28. i. 1911. (No. 5223, A. S. Meek Coll.)

“Iris salmon-red; bill red; feet orange-yellow.”

Both these specimens show more green on the upper tail-coverts than the three specimens from the mountains of British New Guinea, but the second one is quite young.

✓ 51. *Neopsittacus muschenbroeki* (Schleg.).

*Nanodes muschenbroeki* Schlegel, *Ned. Tijdschr. Dierk.* iv. p. 34 (1871—Hatam, Arfak).

6 ♂ ♀; Mt. Goliath, January and February 1911. (Nos. 5137, 5162, 5202, 5203, 5382, 5395, A. S. Meek Coll.)

52. *Oropsitta* (*Cyclopsittacus* auct.) *blythi godmani* (Og.-Grant).

*Cyclopsittacus godmani* Ogilvie-Grant, *Bull. B. O. Club*, xxvii. p. 67 (March 1911—Upper Mimika River).

*Cyclopsitta blythi meeki* Rothschild and Hartert, *Nov. Zool.* xviii. p. 160 (September 1911—Eilanden River).

3 ♂, 4 ♀; Eilanden River, December 1910. (Nos. 5047, 5056, 5057, 5058, 5059, 5064, 5065, A. S. Meek Coll.)

The feathers of the cheeks and sides of head are a little more stiff and narrow than in adult *O. blythi*, but not quite as much developed as in *edwardsi*.

53. *Solenoglossus aterrimus* (Gm.).

(*Microglossus aterrimus* auct.).

*Psittacus aterrimus* Gmelin, *Syst. Nat.* i. 1. p. 330 (1788—“Habitat in Nova Hollandia”).

*Microglossus aterrimus*, *Nov. Zool.* 1901. p. 77.

♀; Snow Mountains, 2500 ft., 12. viii. 1910. (No. 4602, A. S. Meek Coll.)

There appear to be at least three subspecies of this Parrot, viz.—a very large form from the mainland of New Guinea, an intermediate and blacker race from Cape York, and a smaller one from the Western Papuan Islands. The nomenclature of these forms, however, is very complicated, but as we restricted the name of *alecto* to the small island-race (*Nov. Zool.* 1901 p. 77), Mr. Mathews' attempt to fix the type locality of the name *aterrimus* as Waigiu (*Nov. Zool.* xviii. p. 262) is invalid. Our bird from the Snow Mountains has the wings 352 mm. long, *i.e.* only 2 mm. longer than the smallest recorded ♀ of the big continental race.

54. *Dasyptilus pesquetii* (Less.).

*Psittacus Pesquetii* Lesson, *Bull. Sciences Nat.* xxv. p. 24 (June 1831).

♀; Upper Setekwa River, 4. vii. 1910. (No. 4276, A. S. Meek Coll.)

55. *Cacatua triton triton* (Temm.).

*Psittacus triton* Temminck, *Coup d'œil gén. s.l. poss. Néerland. Inde archip.* iii. p. 405 (1849—I of Aidouma). *Teste Salvadori, Orn. Pap.* i. p. 94.

*Cacatua triton triton*, *Nov. Zool.* 1901, p. 78.

♂; Upper Setekwa River, 16. xi. 1910. (No. 5003, A. S. Meek Coll.)

Dr. van Oort (*Nova Guinea* ix., *Zool. livr.* i. p. 70) calls this bird *Cacatua galerita triton*, which is probably more correct, but we cannot at this moment review this group of Cockatoos.

56. *Nasiterna keiensis viridipectus* Rothschild.

*Nasiterna pygmaea viridipectus* Rothschild, *Bull. B.O. Club* xxvii. p. 45 (1911—Upper Setekwa River).

♂ ♀; Upper Setekwa River, 1. viii. 1910. (Nos. 4459, 4460, A. S. Meek Coll.)

“ Iris brown; feet ashy blue; bill slaty blue.”

♂; Snow Mountains, 2000 ft., 14. x. 1910. (No. 4842, A. S. Meek Coll.)

♂; Upper Eilanden River, 7. iii. 1911. (No. 5501, A. S. Meek Coll.)

This bird was described as a subspecies of *N. pygmaea*, and unfortunately the close relationship to *N. keiensis* was overlooked, owing to its close resemblance to the females of *N. pygmaea*. However, it is not absolutely identical with *N. keiensis keiensis*, as Mr. Ogilvie-Grant makes it out (in A. F. R. Wollaston's *Pygmies and Papuas*, p. 287), but it differs from the latter by its smaller bill and slightly shorter wings. Wings of three males 62, and of a ♀ considerably under 60 mm., as opposed to 63—65 in the males and 61 to 62 in females of *N. keiensis keiensis*.

57. *Nasiterna bruijnii* Salvad.

*Nasiterna bruijnii* Salvadori, *Ann. Mus. Civ. Genova* vii. pp. 715, 753, 907, pl. 21 (1875—Arfak Mountains); cf. *Nov. Zool.* 1901. p. 79.

2 ♂ ad., 1 ♂ juv., 3 ♀ ad.; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5097, 5197, 5253, 5351, 5381, 5432, A. S. Meek Coll.)

“ Iris dark brown, feet and bill ashy blue.”

58. *Geoffroyus personatus aruensis* (Gray).

*Psittacus aruensis* Gray, *P. Z. S.* 1858. pp. 183, 195 (Aru Islands).

*Geoffroyus personatus aruensis*, *Nov. Zool.* 1901. p. 84; van Oort, *Nova Guinea* ix. i. p. 72.

3 ♂, 1 ♀; Upper Setekwa River, July and November 1910. (Nos. 4364, 4973, 4974, 5004, A. S. Meek Coll.)

59. *Geoffroyus simplex* (Meyer).

*Pionias simplex* A. B. Meyer, *Verh. zool. bot. Ges. Wien.* lxx. p. 39 (1874—Arfak Mountains).

♂; Snow Mountains, 2000 ft., 25. viii. 1910. (No. 4638, A. S. Meek Coll.)

“ Iris cream; bill entirely black; feet greenish steel-grey.”

This specimen agrees very well with Gould's figure, though the bluish collar is slightly more lavender. Neither the figure nor our specimen, however, agrees entirely with the original description, and they specially show no black on the rump or brown on the back, though the figure was taken from the type.

✓ 60. *Eclectus pectoralis pectoralis* (P. L. S. Müll.).

*Psittacus pectoralis* P. L. S. Müller, *Natursystem*, Suppl. p. 78 (1776—Ex Buffon—rectius Montbeillard—New Guinea, and Moluccas).

Cf. *Nov. Zool.* 1901. p. 81; van Oort, *Nova Guinea* ix. i. p. 71.

♀; Lower Setekwa River, 22. xi. 1910. (No. 5028, A. S. Meek Coll.)

♂ ♀; Upper Setekwa River, 13. ix. 1910. (Nos. 4535, 4536, A. S. Meek Coll.)

♂; Snow Mountains, 2000 ft., 27. ix. 1910. (No. 4741, A. S. Meek Coll.)

✓ 61. *Aprosmictus callopterus wilhelminae* Ogilvie-Grant.

*Aprosmictus wilhelminae* Ogilvie-Grant, *Bull. B.O. Club* xxvii. p. 83 (1911—Kaparé, tributary of the Mimika River).

3 ♂ ad., 4 ♂ juv. and ♀; Snow Mountains, July—November 1910. (Nos. 4551, 4579, 4586, 4630, 4779, 4886, 4934, A. S. Meek Coll.)

“Iris orange-yellow; feet smoky black; bill black.”

In this series the pink tips to the middle rectrices are only to be found in the females and immature males, while there is no sign of them in the adult males and in one of the females.

The specimen from the Resi Mountains mentioned by Dr. van Oort (*Nova Guinea* ix, *Zool. livr.* i. p. 72) as probably belonging to *A. callopterus* belongs most likely to this form.

✓ 62. *Psittacella brehmii brehmii* (Schleg.).

*Psittacus brehmii* Schlegel, *Ned. Tijdschr. Dierk.* iv. p. 35 (1871—Arfak Mountains).

5 ♂, 4 ♀; Mt. Goliath, January and February 1911. (Nos. 5163, 5230, 5249, 5296, 5301, 5302, 5368, 5386, 5427, A. S. Meek Coll.)

In these specimens the head is darker and the pale dorsal bars more yellowish than in the majority of our Arfak specimens, but as the latter are mostly old native-collected material it would be unwise to attach too much importance to this difference. The Mt. Goliath birds are certainly very different from *P. b. pallida*.

63. *Psittacella modesta* (Schleg.).

*Psittacus modestus* Schlegel, *Ned. Tijdschr. Dierk.* iv. p. 36 (1871—Arfak Mountains).

Of this species, hitherto only known from the Arfak Mountains, we have now received the following specimens:

2 ♂, 3 ♀ ad.; Mt. Goliath, January and February 1911. (Nos. 5236, 5237, 5303, 5347, 5417, A. S. Meek Coll.)

“Iris in both sexes yellowish red; bill and feet pale slaty blue.”

In the males the hindneck has the feathers dull orange-yellow edged with brown, while in *P. madaraszi* the orange-yellow is lighter, more conspicuous, and more spot-like. One of our females has some red feathers in the crown.

64. *Loriculus aurantiifrons batavorum* Stres.

*Loriculus aurantiifrons batavorum* Stresemann, *Journ. f. Orn.* October 1913 (New Guinea. Type ♂ Snow Mts.).

♀; Upper Setekwa River, 16. xi. 1910. (No. 5006, A. S. Meek Coll.)

♂ ♀; Snow Mountains, 2000–3000 ft., 28. viii., 19. x. 1910. (Nos. 4655, 4855, A. S. Meek Coll.)

65. *Alcyone azurea lessonii* Cass.

*Alcyone Lessonii* Cassin, *Proc. Acad. Philad.* v. p. 69 (1850—Ex Lesson, New Guinea); cf. *Nov. Zool.* 1901. p. 143.

♂ juv.; Upper Setekwa River, 5. vii. 1910. (No. 4286, A. S. Meek Coll.)

“Iris dark brown; bill black with white tip; feet flesh-colour.”

This young bird is in plumage like the adult ones, only duller and paler.

66. *Ceyx solitaria* Temm.

*Ceyx solitaria* Temminck, *Pl. Col.* 595. Fig. 2 (1836—New Guinea): van Oort, *Nova Guinea* ix. i. p. 77.

2 ♂, 2 ♀ ad., 1 ♀ juv.; Upper Setekwa River, July 1910. (Nos. 4281, 4384, 4393, 4404, 4422, A. S. Meek Coll.)

♀; Snow Mountains, 2500 ft., 31. vii. 1910. (No. 4556, A. S. Meek Coll.)

♂; Upper Eilanden River, 9. iii. 1911. (No. 5510, A. S. Meek Coll.)

67. (?) *Syma torotoro meeki* Rothsch. & Hartert.

*Syma torotoro meeki* Rothschild and Hartert, *Nov. Zool.* viii. p. 147 (1901—British New Guinea, Terra typica: Milne Bay).

♂; Upper Setekwa River, 17. vii. 1910. (No. 4383, A. S. Meek Coll.)

2 ♂; Snow Mountains, September 1910. (Nos. 4738, 4918, A. S. Meek Coll.)

The upperside of *S. torotoro meeki* is often quite as dark as in *S. torotoro torotoro*, but the dimensions are always much smaller, and the underside, as a rule, lighter.

Altogether these specimens are somewhat intermediate between *S. t. tentelare* from the Aru Islands and *S. t. meeki*, but we think they are nearer to the latter. The wings vary, measuring 73–78 mm. Dr. van Oort mentions a female from Sabang, which he unites with *tentelare* (*Nova Guinea* ix. Zool. part I. p. 77, 1909). Unfortunately we have not received any females.

68. *Melidora macrorhina macrorhina* (Less.).

*Dacelo macrorhina* Lesson, *Voy. Coqu.*, Zool. Atlas pl. 31 bis, Fig. 2. Fig. a (1826—Dorey, New Guinea); van Oort, *Nova Guinea* ix. i. p. 78.

2 ♂, 1 ♀; Upper Setekwa River, June—August 1910. (Nos. 4206, 4424, 4513, A. S. Meek Coll.)

2 ♂; Snow Mountains, September 1910. (Nos. 4711, 4749, A. S. Meek Coll.)

69. *Clytoceyx rex imperator* Oort.

*Clytoceyx rex imperator* van Oort, *Nova Guinea*, Zool. ix. p. 79 (1909—Terra typica: Alkmaar).

♀ ad.; Snow Mountains, 3000 ft., 3. xi. 1910. (No. 4947, A. S. Meek Coll.)

“Iris light brown; bill light brown; feet chalky-white and flesh-colour.”

♂ juv.; Mt. Goliath, 3. ii. 1911. (No. 5281, A. S. Meek Coll.)



The type, a male collected by Dr. Lorentz, has a wing of 180 mm., as opposed to 165 of the type of *C. rex rex*. Our female has a wing-measurement of 176 mm., but the young male only shows a wing-measurement of 170; the plumage of the body is very much worn.

✓ 70. **Sauromarptis gaudichaud** (Quoy & Gaim.).

*Dacelo Gaudichaud* Quoy et Gaimard, *Voy. Uranie*, Zool. p. 112. pl. 25 (1824—Papuaría); cf. *Nov. Zool.* 1901. p. 151; van Oort, *Nova Guinea* ix., Zool. i. p. 79.

♀ ad.; Lower Setekwa River, 17. vi. 1910. (No. 4181, A. S. Meek Coll.)

♂ ♀ ad., ♀ juv.; Setekwa River, 18, 19. vi. 1910. (Nos. 4191, 4196, 4199, A. S. Meek Coll.)

♀; Upper Setekwa River, 12. vii. 1910. (No. 4346, A. S. Meek Coll.)

♀; Snow Mountains, 2500 ft., 5. viii. 1910. (No. 4578, A. S. Meek Coll.)

✓ 71. **Halcyon sancta** (Vig. & Horsf.).

*Halcyon sanctus* Vigers and Horsfield, *Trans. Linn. Soc. Lond.* xv. p. 206 (1826—Australia).

♀ jun.; Upper Setekwa River, 15. vii. 1910. (No. 4367, A. S. Meek Coll.)

✓ 72. **Chrysococcyx meyeri** Salvad.

Cf. *Nov. Zool.* 1907. p. 437.

1 ♂, 2 ♀; Snow Mountains, 2000 ft., September 1910. (Nos. 4720, 4721, 4743, A. S. Meek Coll.)

“Iris chocolate; bill black; feet slaty blue.”

✓ 73. **Cacomantis assimilis assimilis** (Gray).

Cf. *Nov. Zool.* 1907. p. 434; van Oort, *Nova Guinea* ix. i. p. 68.

♀ juv.; Lower Setekwa River, 25. xi. 1910. (No. 5036, A. S. Meek Coll.)

♂ juv.; Eilanden River, 14. xii. 1910. (No. 5069, A. S. Meek Coll.)

✓ 74. **Cacomantis castaneiventris** Gould.

Cf. *Nov. Zool.* 1907. p. 435.

♂ ad.; Upper Setekwa River, 1. vii. 1919. (No. 4244, A. S. Meek Coll.)

♂ ad.; Mt. Goliath. 15. ii. 1910. (No. 5398, A. S. Meek Coll.)

✓ 75. **Cacomantis variolosus** (Horsf.).

Cf. *Nov. Zool.* 1907. p. 437.

♂ juv.; Setekwa River, 19. vi. 1910. (No. 4195, A. S. Meek Coll.)

✓ 76. **Cuculus optatus** Gould.

*Cuculus optatus* Gould, *Proc. Zool. Soc. Lond.* Part xiii. 1845. p. 18 (1845—Port Essington in Australia); cf. Hartert, *Vög. pul. Fauna* ii. pp. 949, 950.

“*Cuculus saturatus* Blyth,” Rothschild and Hartert, *Nov. Zool.* 1907. p. 433.

♀ juv.; Lower Setekwa River, 21. xi. 1910. (No. 5023, A. S. Meek Coll.)

♂ ad.; Upper Setekwa River, 26. ix. 1910. (No. 4545, A. S. Meek Coll.)

✓ 77. *Calliechthrus leucolophus* (Müll.).

Cf. *Nov. Zool.* 1907. p. 439; van Oort, *Nova Guinea* ix. i. p. 68.

♂; Lower Setekwa River, 27. xi. 1910. (No. 5042, A. S. Meek Coll.)

♀; Mt. Goliath, 21. ix. 1911. (No. 5232, A. S. Meek Coll.)

✓ 78. *Centropus bernsteini* Schleg.

Cf. *Nov. Zool.* 1907. p. 443.

♀ ad.; Upper Setekwa River, 8. viii. 1910. (No. 4485, A. S. Meek Coll.)

♀ juv.; Eilanden River, 9. xii. 1910. (No. 5053, A. S. Meek Coll.)

✓ 79. *Centropus menbeki menbeki* Less. & Garn.

Cf. *Nov. Zool.* 1907. p. 441; van Oort, *Nova Guinea* ix. i. p. 69.

♂; Upper Setekwa River, 16. ix. 1910. (No. 4547, A. S. Meek Coll.)

♂; Eilanden River, 20. xii. 1910. (No. 5082, A. S. Meek Coll.)

80. *Eurystomus crassirostris crassirostris* Schl.

Cf. *Nov. Zool.* 1903. p. 197.

♀ juv.; Setekwa River, 19. vi. 1910. (No. 4194, A. S. Meek Coll.)

2♂, 2♀ ad.; Upper Setekwa River, 8. 15. xi. 1910. (Nos. 4957, 4997, 4998, 4999, A. S. Meek Coll.)

✓ 81. *Podargus papuensis* Quoy & Gaim.

Cf. *Nov. Zool.* 1903. p. 198; van Oort, *Nova Guinea* ix. i. p. 81.

♀; Upper Setekwa River, 16. vii. 1910. (No. 4376, A. S. Meek Coll.)

"Iris brown-red; bill horn-colour; feet pale dirty green."

✓ 82. *Podargus ocellatus ocellatus* Quoy & Gaim.

Cf. *Nov. Zool.* 1903. p. 199; van Oort, *Nova Guinea* ix. i. p. 82.

♂ ad.; Upper Eilanden River, 3. iii. 1911. (No. 5474, A. S. Meek Coll.)

✓ 83. *Aegotheles salvadorii* Hart.

Cf. *Nov. Zool.* 1903. p. 200.

♂ ad.; Mt. Goliath, 13. ii. 1911. (No. 5374, A. S. Meek Coll.)

"Iris dark brown; bill brown; feet flesh-colour."

✓ 84. *Aegotheles wallacei*.

Cf. *Nov. Zool.* 1903. p. 201.

♀ ad.; Eilanden River, 19. xii. 1910. (No. 5079, A. S. Meek Coll.)

"Iris light brown; bill dark brown; feet flesh-colour."

This bird agrees very well with our ♂ from the Aru Islands. It appears to be very rare, and is only known from the Berau Peninsula and the Aru Islands, but recently Shortridge obtained one on the Wataikwa River at the foot of the Snow Mountains, which, with ours, makes seven recorded specimens.

85. **Caprimulgus macrurus macrurus** Horsf.

Cf. *Nov. Zool.* 1903. p. 202 ; van Oort, *Nova Guinea* ix. i. p. 81.

3 ♂, 1 ♀ ; Upper Setekwa River, July—September 1910. (Nos. 4394, 4499, 4515, 4542, A. S. Meek Coll.)

✓ 86. **Collocalia whiteheadi** Grant.

*Collocalia whiteheadi* Ogilvie-Grant, *Ibis*, 1895, p. 459 (Palawan, Luzon).

♀ ad. ; Mt. Goliath, not less than 5000 ft., 27. i. 1911. (No. 5208, A. S. Meek Coll.)

“ Iris dark brown ; bill and feet black.”

✓ 87. **Collocalia fuciphaga fuciphaga** (Thunb.).

Cf. *Nov. Zool.* 1903. p. 202 ; van Oort, *Nova Guinea* ix., *Zool.* i. p. 82.

♀ ; Lower Setekwa River, 19. xi. 1910. (No. 5010, A. S. Meek Coll.)

3 ♂, 1 ♀ ; Upper Setekwa River, July—September 1910. (Nos. 4325, 4438, 4470, 4533, A. S. Meek Coll.)

♂ ; Snow Mts., 2000 ft., 25. viii. 1910. (No. 4627, A. S. Meek Coll.)

Mr. Oberholser has recently separated a number of new local forms of *C. fuciphaga*, but without his material for comparison we cannot give an opinion on the validity of these forms.

✓ 88. **Chaetura caudacuta caudacuta** (Lath.).

*Hirundo caudacuta* Latham, *Ind. Orn. Suppl.* p. 57 (1801—Australia).

♀ ; Upper Setekwa River, 8. xi. 1910. (No. 4548, A. S. Meek Coll.)

2 ♂, 1 ♀ ; Snow Mountains, 3000–5000 ft., November 1910. (Nos. 4930, 4931, 4932, A. S. Meek Coll.)

✓ 89. **Chaetura novaeguineae** D'Alb. & Salvadori.

*Chaetura novaeguineae* D'Albertis and Salvadori, *Ann. Mus. Genova*, xiv. p. 55 (1879—Fly River).

5 ♂, 2 ♀ ; Upper Setekwa River, August and November 1910. (Nos. 4366, 4440, 4478, 4479, 4969, 4984, A. S. Meek Coll.)

This species was hitherto only known from a single specimen. After Mr. Meek's rediscovery of this species it was also found, by members of the B. O. U. Expedition to New Guinea, on the Mimika River.

90. **Macropteryx mystacea mystacea** (Less.).

*Cypselus mystaceus* Lesson, *Voy. Coquille*, *Zool.*, Atlas, pl. 22 (1826—New Guinea) ; van Oort, *Nova Guinea* ix. i. p. 82.

♀ ; Setekwa River, 28. vi. 1910. (No. 4221, A. S. Meek Coll.)

♀ ; Lower Setekwa River, 26. xi. 1910. (No. 5037, A. S. Meek Coll.)

✓ 91. **Melopitta gigantea** Rothsch.

*Orn. Monatsber.* 1899. p. 137 (“Mt. Maori,” west of Humboldt Bay, north coast of New Guinea).

The type specimen had the rump and upper tail-coverts as well as the greater part of the abdomen, flanks and thighs rufous brown ; the facts that the brown

of the abdomen did not seem to be sharply and quite regularly limited, and that a few black feathers appeared in the brown area, suggested that the bird was immature, though it had the appearance of an adult individual.

Mr. Meek obtained a male (No. 4907) at an elevation of about 3000 ft. in the Snow Mountains, on October 27, 1910, which is pure black all over. The beak is a little, but not much smaller (23 against 26—not 27—in the type); wing 129, tarsus 58 mm.

“ Iris brown ; bill and feet black.”

More material will be necessary to show if the differences between this specimen and the type are due to age, sex, or locality, and if present there would be no excuse for assuming that these birds did not belong to the same form.

✓ 92. *Pitta macklotii macklotii* Temm.

*Pitta Macklotii* Temminck, *Pl. Col.* 547 (1834—Type from Lobo, collected by Salomon Müller); *Nov. Zool.*, 1901. p. 63; van Oort, *Nova Guinea*, ix. i. p. 83.

3 ad.; Upper Setekwa (tributary of Oetakwa) River, 28. vii. and 8. x. 1910. (Nos. 4437, 4494, 4505, A. S. Meek Coll.)

2 ♂, 1 ♀; Snow Mountains, 2000 ft., 22. viii., 1. ix., 9. x. 1910. (Nos. 4606, 4694, 4797, A. S. Meek Coll.)

2 ♂, 1 ♀; Eilanden River, December 1910. (Nos. 5074, 5080, 5081, A. S. Meek Coll.)

✓ 93. *Pitta atricapilla atricapilla* Quoy & Gaim.

*Pitta atricapilla* Quoy & Gaimard, *Voy. Astrolabe*, *Zool.* i. p. 258. pl. 8. fig. 3 (1830—Dorey, north coast of New Guinea); *Nov. Zool.*, 1901. p. 62.

*Pitta novaeguineae* Müller & Schlegel, *Verh. Nat. Gesch. Nederl. Overz. Bez.*, *Zool. Aves, Pitta*, pp. 19, 20 (1839–1844); van Oort, *Nova Guinea* ix, *Zool.* i. p. 82.

1 ♂, 2 ♀; Lower Setekwa (Oetakwa) River, November 1910. (Nos. 5009, 5025, 5035, A. S. Meek Coll.)

♂; Upper Setekwa River, 29. vii. 1910. (No. 4446, A. S. Meek Coll.)

“ Iris dark brown; feet dark smoky horn-colour; bill black.”

5 ♂, 1 ♀; Eilanden River, December 1910. (Nos. 5051, 5052, 5055, 5061, 5063, 5073.)

The wings measure from 101 to 109, but in No. 5063, marked “ male,” only 97.5 mm.

✓ 94. *Chelidon rustica gutturalis* (Scop.).

*Hirundo gutturalis* Scopoli, *Del. Flor. & Faun. Insubr.* ii. p. 96 (1786—“ In *Nova Guiana*, p. 118, tab. 76.” Sic! This does not mean that the bird was found in New Guinea, but that it is the species described and figured in Sonnerat, *Voy. Nouvelle Guinée*, p. 118. pl. 76; the locality there given, and therefore the terra typica for the name *gutturalis* is Antigua, on the Isle of Panay, Philippines!)

♀ juv.; Upper Setekwa River, 13. xi. 1910. (No. 4987, A. S. Meek Coll.)

✓ 95. *Chelidon javanica* (Sparrm.).

*Hirundo javanica* Sparrmann, *Mus. Carls.* ii. Taf. 100 (1789).

*Hirundo frontalis* Quoy et Gaimard, *Voy. Astrolabe*, *Zool.* i. p. 204. pl. 12. fig. 1 (1830—Dorey, New Guinea).

5 ♂ ♀; Upper Setekwa River, August, September, November 1910. (Nos. 4363, 4507, 4508, 4532, 4992, A. S. Meek Coll.)

The late Dr. Sharpe stated that specimens from New Guinea and Torres Straits were paler underneath than typical *javonica*. Comparing our specimens, we cannot find this confirmed, and are unable to find other differences. If they should be separable, the name *frontalis* would of course be available for the Papuan race.

Mr. Mathews treats *neoxena* as a subspecies of *javonica*, and perhaps with good reason.

✓ 96. *Monarcha axillaris* Salvad.

Cf. *Nov. Zool.* 1903. p. 458; 1907. p. 462.

♀ imm.; Snow Mountains, 3000 ft., 22. x. 1910. (No. 4875, A. S. Meek Coll.)

“ Iris dark brown; bill dark slaty-blue with black tip; feet dark slaty-blue.”

Unfortunately we have no specimens from Arfak, which is the terra typica of *M. axillaris*.

97. *Monarcha guttula* (Garn.).

Cf. *Nov. Zool.* 1903. p. 456; van Oort, *Nova Guinea*, ix. i. p. 87.

3 ♂ ad., 1 ♂ juv.; Upper Setekwa River, July and August 1910. (Nos. 4407, 4429, 4496, 4497, A. S. Meek Coll.)

✓ 98. *Monarcha menadensis* (Quoy & Gaim.).

(*Monarcha dichrous auctororum*—preferred on account of the wrong name, the species not being found in Celebes.)

Cf. *Nov. Zool.* 1903. p. 458.

2 ♂, 1 ♀; Setekwa River, 18, 22. vi. 1910. (Nos. 4187, 4190, 4217, A. S. Meek Coll.)

2 ♂, 1 ♀; Upper Setekwa River, July 1910. (Nos. 4236, 4246, 4270, A. S. Meek Coll.)

According to Mr. Meek's sexing in this and former collections, the entirely black-backed birds are males, those with a slate-coloured upperside females; but from the differences in size of some of the black-backed specimens we must conclude that the adult male and female have an entirely black upperside, and differ merely in size, while the slate-backed birds are young or immature. This was already Salvadori's view in *Orn. Pap.* ii. p. 31.

✓ 99. *Monarcha rubiensis* (Meyer).

*Tchitrea rubiensis* A. B. Meyer, *Sitzungsab. k. Akad. Wien* lxi. p. 494 (1874—Rubi).

*Bathmisyrrna rufum* Reichenow, *Orn. Monatsber.* 1897. p. 161 (Gogol River, Kaiserwilhelmsland).

*Monarcha rubiensis* Rothschild & Hartert, *Nov. Zool.* 1903. p. 460 (near Humboldt Bay and Bismarck Mountains).

4 ♂, 3 ♀; Upper Setekwa River, July 1910. (Nos. 4242, 4255, 4320, 4336, 4335, 4343, 4347, A. S. Meek Coll.)

“ Iris dark brown; bill slaty-blue and black; feet slaty-blue.”

The males have the throat black, in one specimen extending down to the jugulum, in the others not extending over the lowest part of the throat. The females have the throat rusty rufous like the breast. Wings of the males 94–97, of the females 90–93 mm.

One of the males has over a dozen white (albinistic) feathers on the crown.

100. *Arses telescopthalmus harterti* Oort.

Van Oort, *Nova Guinea* ix. 1. p. 86 (1909—Noord River, Sabang, Geitenkamp, collected by Lorentz).

♂ ♀ ; Setekwa River, 19, 23. vi. 1910. (Nos. 4200, 4229, A. S. Meek Coll.)

1 ♂, 2 ♀ ; Upper Setekwa River, July and August 1910. (Nos. 4284, 4359, 4488, A. S. Meek Coll.)

♂ ♀ ; Snow Mountains, 2000 ft., August 1910. (Nos. 4645, 4684, A. S. Meek Coll.)

“ ♂ ♀ : Iris dark brown ; eyelids blue ; bill and feet slaty-blue.”

In addition to the characters pointed out by Dr. van Oort, it seems that the bare skin of the eyelids is not quite so largely developed as in *A. t. aruensis*. The wings of our males measure 78–83, those of the females 77–79 mm. There is thus a considerable amount of variation, and not much difference, if any, from *A. t. aruensis* in size.

101. *Rhipidura tricolor* (Vieill.).

Cf. *Nov. Zool.* 1903. p. 462 ; van Oort, *Nova Guinea* ix. i. p. 85.

3 ♂ ad., 2 ♀ ad., 1 juv. ; Upper Setekwa River, July and September 1910. (Nos. 4373, 4524, 4537, 4538, 4539, A. S. Meek Coll.)

102. *Rhipidura threnothorax* S. Müll.

Cf. *Nov. Zool.* 1903. p. 463 ; van Oort, *Nova Guinea* ix. i. p. 85.

6 ♂ ♀ ad. ; Upper Setekwa River, June, July, August 1910. (Nos. 4197, 4265, 4269, 4411, 4454, 4518, A. S. Meek Coll.)

“ Iris dark brown ; bill black ; lower mandible whitish horn-colour.”

The white spots on the breast vary much in size.

103. *Rhipidura leucothorax* Salvad.

Cf. *Nov. Zool.* 1903. p. 463.

2 ♂ ad. ; Setekwa River, 21, 23. vi. 1910. (Nos. 4213, 4234, A. S. Meek Coll.)

4 ♂ ; Upper Setekwa River, July 1910. (Nos. 4264, 4398, 4409, 4417, A. S. Meek Coll.)

“ Iris dark brown ; bill black, lower whitish horn-colour ; feet black.”

104. *Rhipidura setosa gularis* S. Müll.

Cf. *Nov. Zool.* 1903. p. 464.

6 ♂ ♀ ; Upper Setekwa River, 17–25. vii. 1910. (Nos. 4386, 4385, 4401, 4402, 4428, A. S. Meek Coll.)

105. *Rhipidura auricularis* de Vis.

*Rhipidura auricularis* de Vis, *Report on New Guinea, Birds*, p. 2 (1890—Musgrave Range) ; *Nov. Zool.* 1903. p. 465.

1 ♂, 3 ♀ ; Mt. Goliath, not less than 5000 ft., January 1911. (Nos. 5132, 5166, 5434, 5445, A. S. Meek Coll.)

“ Iris dark brown ; feet dark brown, almost black ; bill : upper black, lower flesh-colour with blackish tip.”

Male : wing 81, females 76.5–77 mm. The male appears thus to be much larger,

and its back is a little darker, otherwise there appears to be no difference between the sexes. The skins from Mt. Goliath agree perfectly with those from the Aroa, Mambare and Angabunga Rivers in British New Guinea.

✓ 106. *Rhipidura atra* Salvad.

Cf. *Nov. Zool.* 1903. p. 465.

1 ♂ juv. in the first rufous plumage, 1 ♂ jun. changing from the rufous into the black plumage; Snow Mountains, 2500 and 3000 ft., 4. viii. and 20. x. 1910. (Nos. 4570, 4863, A. S. Meek Coll.)

3 ♂ ad., 3 ♀; Mt. Goliath, January 1911. (Nos. 5092, 5115, 5190, 5200, 5396, 5443, A. S. Meek Coll.)

“Iris dark brown; feet dark brown; bill: upper black, lower flesh-colour.”

✓ 107. *Rhipidura hyperythra mülleri* Meyer.

[*Rhipidura hyperythra* Gray, *Proc. Zool. Soc. Lond.*, 1858. p. 176. Aru Islands!]

*Rhipidura rufiventris* Müller (nec Vieillot!), *Verh. Nat. Gesch. Ned. Ind. Land- en Volkenk.* p. 185 (1839-44—Lobo!)

*Rhipidura Mülleri* A. B. Meyer, *Sitzungsber. k. Ak. Wiss. Wien* lxxix. p. 502 (1874—New name for *rufiventris*, no description. Terra typica for the name *mülleri* therefore=Lobo!)

There appear to be three races at least of *Rhipidura hyperythra*: one from the Aru Islands, with nearly the whole throat slate-black, merely a chin-spot being white, one from the Mountains of British New Guinea with more white on the chin, the greater part of the throat being white, and with a larger white patch to the rectrices—14-17 mm. in the outer pair, against 11-12 in typical *hyperythra*, and a third from various parts of Dutch New Guinea, with the throat generally not quite so far white as in the birds from British New Guinea, viz. Ramsay's *castaneothorax*, and the tips to the rectrices small, those of the outer pairs being white for 7-10 mm. These latter birds must apparently be called *mülleri*, which is a new name for *rufiventris*. Of this last form we had four from near Humboldt Bay, collected by Mr. Dumas, and Meek now sent us:

4 ♂, 2 ♀ from the Snow Mountains, 2500-3000 ft., August and September 1910. (Nos. 4588, 4599, 4620, 4706, 4707, 4892, A. S. Meek Coll.)

✓ 108. *Rhipidura rufidorsa* Mey.

Cf. *Nov. Zool.* 1903. p. 465.

♀; Setekwa River, 22. vi. 1910. (No. 4215, A. S. Meek Coll.)

4 ♂ ♀; Upper Setekwa River, 25. vii., 16. viii., 12. xi. 1910. (Nos. 4425, 4579, 4520, 4980, A. S. Meek Coll.)

♂; Snow Mountains, 2000 ft., 14. x. 1910. (No. 4844, A. S. Meek Coll.)

The species of the genus *Rhipidura* are, as in many other genera, unnaturally grouped in the *Hand-list of Birds*, and it would be very useful if some one could find the time to rearrange them.

✓ 109. *Microeca flavovirescens* Gray.

Cf. *Nov. Zool.* 1903. p. 471; van Oort, *Nova Guinea* ix. i. p. 83.

3 ♂, 3 ♀; Upper Setekwa River, July and August 1910. (Nos. 4278, 4331, 4351, 4354, 4395, 4512, A. S. Meek Coll.)

♀; Upper Eilanden River, 6. iii. 1911. (No. 5489, A. S. Meek Coll.)

“Iris dark brown; feet yellow; bill: upper black, lower yellow, white at base.”

✓ 110. *Microeca papuana* A. B. Meyer.

Cf. *Nov. Zool.* 1903. p. 470.

♂ juv.; Mt. Goliath, 10. i. 1911. (No. 5085, A. S. Meek Coll.) This specimen has cream-yellow tips to the upper wing-coverts, secondaries, and some of the feathers of the crown.

8 ♂ ♀ ad.; Mt. Goliath, January 1911. (Nos. 5157, 5158, 5160, 5175, 5176, 5177, 5436, A. S. Meek Coll.)

✓ 111. *Poecilodryas (Megalestes) albonotata griseiventris* subsp. nov.

Differs from *Poecilodryas (Megalestes) albonotata albonotata* (originally described from Arfak, common in the mountains of British New Guinea) in having the whole abdomen ashy-grey, only the vent and under tail-coverts being white, while in *P. albonotata albonotata* the middle of the abdomen, almost to the chest, is more or less white; this character is, of course, variable, but in our series the difference is very conspicuous. Type of the new form: ♂ No. 5454, Mt. Goliath, 14. i. 1911.

The distribution of *P. albonotata albonotata* is peculiar, in view of the—apparently—isolated occurrence on Mt. Goliath of *P. a. griseiventris*, but as far as we can see from comparison with only two bad skins from Arfak, there is no difference between the latter and a fine series from British New Guinea.

Mr. Meek sent the following examples of the new form:

5 ♂, 3 ♀; Mt. Goliath, up to 5000 ft., January and February 1911. (Nos. 5105, 5169, 5196, 5209, 5210, 5257, 5367, 5454, A. S. Meek Coll.)

“Iris dark brown; bill and feet black.”

Wings: ♂ 110–114, ♀ 105–108 mm.

We think this species should be included in the genus *Poecilodryas*, and not separated as *Megalestes*.

✓ 112. *Poecilodryas hypoleuca* (Gray).

Cf. *Nov. Zool.* 1903. p. 468; van Oort, *Nova Guinea* ix. i. p. 84.

4 ♂, 1 ♀; Lower Setekwa River, June and November 1910. (Nos. 4184, 4189, 4202, 4220, 5043, A. S. Meek Coll.)

♂; Upper Setekwa River, 13. vii. 1910. (No. 4360, A. S. Meek Coll.)

♂ ♀; Upper Eilanden River, March 1911. (Nos. 5481, 5490, A. S. Meek Coll.)

✓ 113. *Poecilodryas cyanus subcyanea* de Vis.

Cf. *Nov. Zool.* 1903. p. 470.

♂ ad.; Mt. Goliath, 22. i. 1911. (No. 5153, A. S. Meek Coll.)

♂ juv., changing from the rufous brown-striped plumage into the slaty-blue one, Mt. Goliath, 13. i. 1911. (No. 5451, A. S. Meek Coll.)

7 ♀ ad.; Mt. Goliath, January, February 1911. (Nos. 5104, 5176, 5178, 5365, 5439, 5440, 5447, A. S. Meek Coll.)

It seems that these specimens belong to *P. c. subcyanea*, described from the mountains of British New Guinea. The wings of the females measure 81–84, that of the male 88 mm. Specimens from British New Guinea are often still larger—wings to 92 mm.



✓ 114. *Poecilodryas leucops nigro-orbitalis* subsp. nov.

Differs from the other Papuan forms of *P. leucops* in the great extent of white on the chin, which extends over the greater part of the throat, and is thus nearest to *P. leucops albigularis* from Cape York (cf. *Nov. Zool.* 1907, p. 459), but differs from the latter in having the eyelids black, the white loreal patch not extending in a narrow line round the eye, as in *P. l. albigularis*; the black line dividing the two white loreal patches along the middle of the forehead wider, the bill a little larger. Crown slate-colour, paler in the middle and towards the nape; back olive-green; throat white, rest of under-surface yellow, across the chest a clouded dusky band. Wings of males 74-77, of females (as sexed by the collector) 68-74 mm.

Type: ♂, 4862; Snow Mountains, 20. x. 1910.

3 ♂, 3 ♀; Snow Mountains, October 1910. (Nos. 4861, 4862, 4881, 4882, 4902, 4906, A. S. Meek Coll.)

"Iris brown, feet pale straw-yellow; bill black, utmost base pale."

✓ 115. *Poecilodryas bimaculata* (Salvad.).

Cf. *Nov. Zool.* 1903. p. 468; 1907. p. 459.

5 ♂; Snow Mountains, September and October 1910. (Nos. 4718, 4794, 4868, 4872, 4783, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

These specimens have all rather little white on the abdomen, while the majority, though not all, of our specimens from British New Guinea have more white on the abdomen, but, apparently, the males less than the females. The wings of the Snow Mountains examples measure 79-85.5 mm. Possibly a large series may confirm the difference and lead to the establishment of a new subspecies.

✓ 116. *Heteromyias armiti* (de Vis).

Cf. *Nov. Zool.* 1903. p. 467, pl. xiii. fig. 3.

2 ♂, 6 ♀; Mt. Goliath, January 1911. (Nos. 5179, 5180, 5194, 5275, 5294, 5352, 5397, 5412, A. S. Meek Coll.)

"Iris dark brown; bill black, in some specimens with the tip widely whitish horn-colour; feet flesh-colour."

Some of these specimens have a more decided greyish tinge across the breast than our specimens from British New Guinea. Wings 88-97 mm.

117. *Gerygone palpebrosa palpebrosa* Wall.

Cf. *Nov. Zool.* 1903. p. 472.

♂ ad.; Snow Mountains, 3000 ft., 23. x. 1910. (No. 4878, A. S. Meek Coll.)

2 ♂ ad.; Upper Eilanden River, 9. iii. 1911. (Nos. 5508, 5509, A. S. Meek Coll.)

"Iris dark red; feet dull slaty-blue; bill black."

*Gerygone palpebrosa wahuasi* (Mey.) is the black-headed form from German New Guinea. Cf. *Nov. Zool.* 1903, p. 472.

118. *Gerygone chrysogaster* Gray.

Cf. *Nov. Zool.* 1903. p. 472; van Oort, *Nova Guinea* ix. i. p. 83 (1909—Noord River).

6 ♂ ♀; Upper Setekwa River, July and August 1910. (Nos. 4235, 4297, 4379, 4382, 4421, 4502, A. S. Meek Coll.)

♂ ♀; Upper Eilanden River, 10. iii. 1911. (Nos. 5511, 5512, A. S. Meek Coll.)

The iris, according to the labels, varies in colour. It is described as grey, reddish brown, burnt sienna, light brown, and dark red!

Heinrich Kühn marked the iris in specimens from the Aru Islands as chocolate, brownish red, and dark greyish brown. W. Doherty called it pale scarlet and whitish scarlet, Dr. Lorentz dark brown. We cannot see differences between these specimens and others from Aru. The yellow of the lower abdomen and vent is rather brighter in adult birds, paler in young ones.

119. *Gerygone conspicillata* subsp. ?

Cf. *Nov. Zool.* 1903. p. 473.

♂; Lower Setekwa River, 21. xi. 1910. (No. 5022, A. S. Meek Coll.)

"Iris red; feet slaty-blue; bill black."

This specimen agrees on the whole with *G. conspicillata*, but the upperside has a greyish tinge. Wing 55 mm.

✓ 120. *Gerygone (Eugerygone) rubra* (Sharpe).

Cf. *Nov. Zool.* 1903. p. 474.

2 ♂; Mt. Goliath, 18. i., 2. ii. 1911. (Nos. 5134, 5273, A. S. Meek Coll.)

"Iris dark brown; bill black, with base light horn-colour; feet brown and yellow."

The wings of these two birds measure only 58 mm., while in a specimen from Mt. Cameron (Owen Stanley Range) they measure 63 mm.

✓ 121. *Machaerirhynchus flaviventer xanthogenys* Gray.

Cf. *Nov. Zool.* 1903. p. 476; 1912 (xix.) p. 201.

♂ ♀; Upper Setekwa River, 1, 9. viii. 1910. (Nos. 4458, 4489, A. S. Meek Coll.)

♀; Upper Eilanden River, 7. iii. 1911. (No. 5497, A. S. Meek Coll.)

✓ 122. *Machaerirhynchus nigripectus saturatus* subsp. nov.

[*Machaerirhynchus nigripectus* Schlegel, *Ned. Tijdschr. Dierkunde* iv. p. 43 (1871—New Guinea Terra typica: Arfak!); *Nov. Zool.* 1903. p. 476, note.]

Differs from Arfak specimens in being larger, wings of males 62.5–66, females 60–63.5 mm., and the females are darker on the upperside, not fuscous grey (as in Arfak individuals), but deep blackish brown, almost black. Type ♀ No. 5276, Mt. Goliath, 2. ii. 1911. The males seem to be also rather bright yellow underneath.

The birds from British New Guinea have been separated by Dr. van Oort as *M. n. harterti* (*Notes Leyden Mus.* xxx. p. 235); they have the wings as long as in *saturatus*, but the females are not so blackish on the upperside as those of the latter, and the underside is brighter yellow.

Of *M. nigripectus saturatus* Mr. Meek sent us:

4 ♂, 6 ♀; Mt. Goliath, January, February, and March 1911. (Nos. 5130, 5184, 5227, 5238, 5276, 5277, 5295, 5407, 5424, 5498, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

✓ 123. *Clytomyias insignis oorti* R. & H.

Cf. *Nov. Zool.* 1907. p. 460 (Angabunga River, A. S. Meek Coll.).

♀; Mt. Goliath, 19. ii. 1911. (No. 5419, A. S. Meek Coll.)

This specimen agrees with the females from the Angabunga River and Bihagi. Wing 57 mm. The specimens from British New Guinea have the wings 53-57 mm.

✓ 124. *Todopsis cyanocephalus bonapartii* Gray.

Cf. *Nov. Zool.* 1903. p. 477; van Oort, *Nova Guinea* ix. i. p. 84.

2 ♂ ad., 2 ♀ ad., 1 ♂ juv.; Setekwa River, June, July, August 1910. (Nos. 4208, 4209, 4210, 4462, 4463, A. S. Meek Coll.)

The young bird (No. 4210) is of interest. It is evidently in the first plumage, just out of nest. The crown is dull deep brown, with a few blue feathers sprouting, sides of head darker. Underside dull white, sides of body cinnamon rufous, back dark cinnamon rufous, upper tail-coverts blackish.

♂ ♀ ad.; Upper Eilanden River, 4. iii. 1911. (Nos. 5479, 5480, A. S. Meek Coll.)

In the male the breast is not so deep blue-black as in those from the Setekwa River, but the intensity of the colours varies in these birds.

Possibly our *T. c. dohertyi* from Takar (cf. *Nov. Zool.* 1903. p. 477) will not be tenable, the dark colour of the back perhaps being due to dampness of the skins while drying.

✓ 125. *Todopsis wallacii* Gray.

Cf. *Nov. Zool.* 1903. p. 477.

2 ♂; Snow Mountains, 3000 ft., 22. viii., 21. x. 1910. (Nos. 4605, 4867, A. S. Meek Coll.)

♂; Upper Setekwa River, 25. vii. 1910. (No. 4423, A. S. Meek Coll.)

3 ♂; Upper Eilanden River, 6. iii. 1911. (Nos. 5493, 5494, 5495, A. S. Meek Coll.)

126. *Campochaera sloetii flaviceps* Salvad.

Cf. *Nov. Zool.* 1903. p. 209.

2 ♂, 3 ♀; Snow Mountains, 2000 ft., August to October 1910. (Nos. 4615, 4752, 4754, 4762, 4772, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

Unfortunately we have no typical *C. sloetii* from the original locality to compare.

✓ 127. *Coracina caeruleogrisea* (Gray).

*Graucalus caeruleogriseus*, *Nov. Zool.* 1903. p. 203; van Oort, *Nova Guinea* ix., *Zool. livr.* i. p. 87 (1909).

1 "♂" juv.; Upper Setekwa River, 6. vii. 1910. (No. 4301, A. S. Meek Coll.)

This specimen is evidently young, as it shows buff tips to the rather pointed rectrices, quills, and upper tail-coverts.

2 ♂ ad., 1 ♂ juv., 2 ♀ ad.; Snow Mountains, 2000 and 3000 ft., August, October, November 1910. (Nos. 4681, 4798, 4874, 4922, 4940, A. S. Meek Coll.)

128. *Coracina papuensis papuensis* (Gm.).

*Graucalus papuensis papuensis* Rothschild & Hartert, *Nov. Zool.* 1933. p. 205.

4 ♂, 2 ♀; Upper Setekwa River, July, August, November 1910. (Nos. 4390, 4391, 4406, 4484, 4991, 5038, A. S. Meek Coll.)

These specimens clearly do not belong to *C. papuensis meekiana* R. & H. (*Nov. Zool.* 1912. p. 201), which is much paler on the chest and throat.

129. *Coracina longicauda* De Vis.

*Graucalus longicauda* De Vis, *Report New Guinea* for 1889, p. 59 (1890—Musgrave Range); Rothschild and Hartert, *Nov. Zool.* 1903. p. 204.

♂ ad.; Mt. Goliath, not less than 5000 ft., 14. i. 1911. (No. 5122, A. S. Meek Coll.)

“Iris dark brown; bill and feet black.”

Wing 170, tail 150 mm.

130. *Edoliisoma amboinense mülleri* Salvad.

[*Campephaga amboinensis* Hartlaub, *Journ. f. Orn.* 1865. p. 156. Amboina.]

*Ceblepyris plumbea* S. Müller, *Nat. Gesch. Ned. Overz. Bez., Verh. Land- en Volkenkunde* p. 189 (1839-1844—Partim, ex Nova Guinea tantum); terra typica Utanata River, S.W. Papua.

[The name has generally been rejected by Salvadori and others, because Wagler, *Syst. Av.*, under the genus *Corvus*, among the species wrongly placed in the latter, says that the *Corvus novae-guineae* of Gmelin should be looked up under “*Ceblepyr. plumb.*” Evidently Wagler invented the latter name as a substitute for the *Corvus novae-guineae*, which is neither a *Corvus* nor does it occur in New Guinea; Wagler was prevented, by his untimely death, from publishing his full account, but the name *Ceblepyris plumbea* might be construed as being fixed. Dr. van Oort does not share this view, but looks upon “*Ceblepyr. plumb.*” as a nomen nudum. Both points of view have something to recommend them, but we prefer to accept that of Salvadori.]

*Edoliisoma amboinense mülleri* Rothschild and Hartert, *Nov. Zool.* 1903. p. 208.

*Edoliisoma plumbea* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 88 (1909—Noord River and Sabang).

♀ jun.; Setekwa River, 20. vi. 1910. (No. 4207, A. S. Meek Coll.)

The specimen is very pale underneath, with rather little spotting.

131. *Edoliisoma schisticeps poliopse* Sharpe.

Cf. *Nov. Zool.* 1903. p. 208; van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 88 (Alkmaar, Resi Kamp).

♀; Upper Setekwa River, 24. vii. 1910. (No. 4419, A. S. Meek Coll.)

2 ♂, 3 ♀ ad.; Snow Mountains, 2000-3000 ft., August to October 1910. (Nos. 4574, 4625, 4649, 4750, 4923, A. S. Meek Coll.)

“Iris in both sexes dark brown; bill and feet black.”

The male appears to be indistinguishable from that of *E. schisticeps schisticeps*, while the female differs by the slate-grey colour of the chin, cheeks and ear-coverts.

132. *Edoliisoma montanum minus* Rothschild & Hart (?).

*Edoliisoma montana minus* Rothschild and Hartert, *Nov. Zool.* 1907 p. 464 (British New Guinea, type ♂ ad. Bihagi).

*Edoliisoma montana* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 89 (♂ Hellwig Mountains).

1 ♂, 2 ♀; Mt. Goliath, January and February 1911. (Nos. 5243, 5244, 5361, A. S. Meek Coll.)

“Iris dark brown; bill and feet black.”

Only one of the females is not in moult, so that the wings can be properly measured. We make it 124.5 mm. It would thus belong to the smaller form, which we named "*minus*."

✓ 133. **Edoliisoma meyeri sharpei** Rothsch. & Hart.

*Edoliisoma meyeri sharpei* Rothschild and Hartert, *Nov. Zool.* 1903. p. 208 (N.E. coast of British New Guinea); van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 89 ("Resi Kamp").

♂; Upper Setekwa River, 22. vii. 1910. (Nos. 4408, A. S. Meek Coll.)

2 ♂; Snow Mountains, 2000 and 3000 ft., 25. viii., 23. x. 1910. (Nos. 4637, 4888, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

Wings 113-115.5 mm.

✓ 134. ? **Edoliisoma incertum** (Meyer).

*Campephaga incerta* Meyer, *Sitzungsber. k. Akad. Wiss. Wien* lxxix. p. 387 (1874—Jobi Island).

"♀"; Snow Mountains 29. x. 1910. (No. 4917, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

This specimen, marked ♀, agrees well with the description of Meyer, except that the wing measures only 109 and not 115 mm., but Sharpe gives (*Cat. B.* iv. p. 52) only 4.5 in. = 114 mm.

135. **Edoliisoma melas** (Less.) (? an *meeki*)

Cf. *Nov. Zool.* 1903. p. 206; van Oort, *Nova Guinea*, ix., *Zool.*, livr. i. p. 89.

3 ♂, 3 ♀; Upper Setekwa River, July and August 1910. (Nos. 4292, 4433, 4455, 4456, 4457, 4495, A. S. Meek Coll.)

♂; Snow Mountains, 2000 ft., 5. ix. 1910. (No. 4717, A. S. Meek Coll.)

It seems that the females are somewhat intermediate between those of *E. melas melas* and *E. melas meeki*. Altogether they vary a good deal, and as the males appear to be indistinguishable we do not see our way to say for certain whether these specimens should be classed with *E. melas melas*, *meeki*, or an intermediate race.

✓ 136. **Aethomyias spilodera guttata** ? an subsp. nov.

Cf. *Nov. Zool.* 1903. p. 475.

4 ♂ ad., 1 ♂ juv.; Snow Mountains, 2000 ft., 24. and 25. viii. 1910. (Nos. 4617, 4633 to 4636, A. S. Meek Coll.)

*Ae. spilodera guttata* differs from *Ae. spilodera spilodera* in the colour of the forehead, which is reddish brown with blackish tips to the feathers, instead of dark, almost blackish, olive without distinct spots. Our specimens from the Snow Mountains have a rather distinct rufous forehead, but we do not venture to separate them on that account from the material at present at hand. Young birds of the two recognised races appear to be quite similar to each other.

137. **Crateroscelis murina** (Scl.) subsp. ?

Cf. *Nov. Zool.* 1903. p. 226, 227; 1907. p. 465.

7 ♂ ♀; Upper Setekwa River, July 1910. (Nos. 4282, 4283, 4285, 4296, 4308, 4381, 4369, A. S. Meek Coll.)

2 ♂, 1 ♀; Snow Mountains, 2000 to 3000 ft., 25. viii., 23. x. 1910. (Nos. 4628, 4629, 4877, A. S. Meek Coll.)

♂ ; Upper Eilanden River, 4. iii. 1911. (No. 5482, A. S. Meek Coll.)

The subspecies of this bird are not yet worked out. As the type locality for *C. murina* we have to consider Lobo Bay, while Meyer described *brunneiventris* from Rubi (*Sitzungsber. k. Ak. Wien* lxi. p. 497, description of a young bird), Ramsay his *fulvipectoris* (sic) from British New Guinea (Goldie River), and we (*Nov. Zool.* 1903. p. 227) our *rufobrunnea* from near Humboldt Bay, the latter being, as we now know, also a young bird, in which the whole underside is rufous and the lower mandible black, not light horn-colour, as in the adult birds. There are, apart from minor differences in size, some variations in all our birds; the type of our *rufobrunnea* is rather dark rufescent underneath, while young birds with dark undermandibles from Bihagi, Upper Mambare River, are paler on the under-surface; a male and two females, apparently adult, collected by Heinrich Kühn on Mysol are also rather pale brownish underneath, the brownish buff extending over the throat; the heads are almost uniform with the back. These Mysol birds appear to belong to a localised subspecies.

138. *Malurus alboscapulatus alboscapulatus* Mey.

Cf. *Nov. Zool.* 1903. p. 478 ; van Oort, *Nova Guinea* ix. i. p. 91.

3 ♂ ad. ; Upper Setekwa River, July and November 1910. (Nos. 4289, 4313, 4963, A. S. Meek Coll.)

These specimens do not belong to *M. a naimii*, as their wings measure 48·5, 51, 51·5 mm.

139. *Malurus lorentzi* Oort.

*Malurus lorentzi* van Oort, *Nova Guinea* ix. i. p. 91 (1909—Noord River).

6 ♂ ♀ ; Upper Setekwa River, July and November 1910. (Nos. 4312, 4314, 4326, 4327, 4362, 4964, A. S. Meek Coll.)

“ Iris brown ; bill black ; feet vandyke brown.”

Males and females are alike in colour, and Dr. van Oort's female, which is more buff underneath, is probably not adult. The white superciliary line is indistinct in some specimens. Wings 47–51 mm.

140. *Sericornis perspicillata* Salvad.

Cf. *Nov. Zool.* 1903. p. 228 ; 1907. p. 466.

9 ♂ ♀ ad. ; Mt. Goliath, about 5000 ft., January and February 1911. (Nos. 5133, 5165, 5263, 5265, 5282, 5292, 5293, 5345, 5400, A. S. Meek Coll.)

“ Iris brown ; bill black (base of lower mandible light horn) ; feet light horn-brown or flesh-colour.”

141. *Sericornis olivacea* Salvad.

Cf. *Nov. Zool.* 1907. p. 466.

♀ ; Snow Mountains, 30. x. 1910. (No. 4920, A. S. Meek Coll.)

142. *Sericornis arfakiana nouhuysi* Oort.

*Sericornis arfakiana nouhuysi* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 90 (1909—Hellwig Mountains. Type compared).

7 ♂ ♀ ad., 1 ♂ juv. ; Mt. Goliath, January and February 1911. (Nos. 5172, 5181, 5195, 5280, 5309, 5349, 5371, 5409, A. S. Meek Coll.)

“ Iris brown, dark brown, reddish brown, dark red ; bill black ; feet brown.”

We have compared this fine series with the type of *S. arfakiana nouhuysi* and find it to agree perfectly. The young bird (No. 5349) is darker and much more rufescent on the underside.

Comparing all the *Sericornis* of this group, we come to the conclusion that three forms can be distinguished:

*Sericornis arfakiana arfakiana* Salvad.

Arfak, hills near Humboldt Bay, Karon Mountains.

Besides one of the types (specimen *c* of the list on p. 408 in Salvadori's *Orn. Pap.* ii.), we have examined a ♀ from Karon in the Leyden Museum, and an adult and two young birds from "Mt. Moari" near Humboldt Bay, collected by J. M. Dumas.

The young birds are more strikingly distinct from *S. a. nouhuysi* than the old ones, being more yellowish, less rufescent, than the young of *S. a. nouhuysi*. The adult birds have distinct pale edges to the greater upper wing-coverts.

† *Sericornis arfakiana nouhuysi* Oort.

Hellwig Mountains, Mt. Goliath.

Differs from *S. a. arfakiana* in being much more rufescent above as well as underneath, which is especially striking in the young birds. There are no distinct pale edges to the greater upper wing-coverts. This form is larger than *S. a. arfakiana*, but not much. Wings of the males 64–67, of the females 59·5–62 mm., allowing for one probably erroneously sexed specimen.

‡ *Sericornis arfakiana oorti* subsp. nov.

A series of specimens from the Kotoi district, Mt. Cameron, Eafa, Aroa River, Angabunga River, and Bihagi differ again from *S. a. arfakiana* in being paler olive, and more yellowish underneath, the feathers having distinct yellow edges, producing a somewhat streaked appearance. The young birds are much more rufescent, thus resembling the adult—but not the young—of *S. a. arfakiana*, except in size. The wings measure about 60–61 in the females, and run up to 66 in the males. Type of *S. a. oorti* ♂, No. A 2464, A. S. Meek Coll., Bihagi, head of Mambare River, 19. ii. 1906, in the Tring Museum.

The specimens from British New Guinea were formerly enumerated by us as "*Sericornis arfakiana*" (*Nov. Zool.* 1903, p. 228; 1907, p. 467).

We have also received a skin from the Rawlinson Mountains, 1250 m. high, shot on October 10, 1911. It appears to be slightly more rufescent than *S. a. arfakiana*, but as it is in bad condition it is not easy to say whether it belongs to the latter or to *S. a. nouhuysi*. With this bird were sent the nest and two broken eggs.

The nest is placed in two big rolled-up leaves, like a tailor-bird's nest, though no stitches are noticeable. The nest itself is composed of ferns, moss, and dry leaves, lined with a few feathers. The two eggs are of a brownish cream-colour with a pink tinge, and with a brown zone at the large end. They measure 22·8 × 15·7, and 21·6 × 15·6 mm.

143. *Sericornis meeki* sp. nov.

♀ ad. Upper surface greenish olive, browner on the head and brighter, more greenish on the rump, but upper tail-coverts a shade more rufescent, lesser upper wing-coverts with more greenish edges, larger series with paler tips. Quills dark

brown, outwardly margined with olive-brown, lighter on the outermost ones, narrow inner edges greyish buff. Rectrices dark brown, widely margined with rufous-olive, and with a wide subterminal black bar. Loes and ear-coverts olive-brown, only a faint shade paler than the crown, around the eye an indication of a pale and more yellowish ring. Chin, throat, and chest brownish buff, abdomen olive-yellow, flanks more olive. Under tail-coverts yellowish buff. Under wing-coverts dull brownish yellow.

"Iris dark brown (and grey); feet brown, toes orange-yellowish; bill blackish horn-colour, base of lower jaw paler."

Wings 54.5 and 55, tail 39, culmen, 12.5 mm.

Type: ♀, Mt. Goliath, 8. ii. 1911. (No. 5338, A. S. Meek Coll.)

2 ♀; Mt. Goliath, 31. i. and 8. ii. 1911. (Nos. 5252, 5338, A. S. Meek Coll.)

In the Leyden Museum is a female from an elevation of 2600 m. on the Hellwig Mountains, collected by Dr. H. A. Lorentz, which is very similar to *S. meeki* on the upperside, but brownish buff underneath. It seems to be a young bird, and might perhaps belong to *S. meeki*.

#### 144. *Sericornis*?

♂ juv.; Snow Mountains, 5. viii. 1910. (No. 4576, A. S. Meek Coll.)

This is a perfectly young bird, evidently a *Sericornis*, but it does not agree with any of the species we are acquainted with. The bill is black, iris "light grey." Upper surface dull olive-green, underside pale yellow, throat and chest with olive-green longitudinal spots.

#### ✓ 145. *Amalocichla brevicauda* (De Vis).

Cf. *Nov. Zool.* 1903. p. 226; 1907. p. 465.

♂; Mt. Goliath, 4. ii. 1911. (No. 5297, A. S. Meek Coll.)

The specimen agrees with our series from the mountains of British New Guinea, but the upperside and breast are a shade darker. It would be interesting to compare a series from Mt. Goliath. The young bird is spotted like a young thrush.

#### ✓ 146. *Androphilus viridis* Rothschild & Hart.

*Androphilus viridis* Rothschild and Hartert, *Bull. B.O. Club*, xxix. p. 33 (December 1911—Mt. Goliath).

♂; Mt. Goliath, 9. ii. 1911. (No. 5346, A. S. Meek Coll.)

The description of the single specimen in the *Bull. B.O. Club* is as follows: "Upperside olive-green, the feathers being browner in the middle and at the base, upper tail-coverts slightly browner; quills deep brown, outer edges green, like the back; tail greenish olive; sides of head and neck like the back; a short white malar stripe; throat and chest black, rest of underside olive-green. Iris dark brown; bill black; feet vandyke-brown. Culmen 15, wing 66, tail 72, tarsus 26 mm."

#### 147. *Ifrita coronata* Rothschild.

Cf. *Bull. B.O. Club* May 1898; *Nov. Zool.* vi. pl. iii.; *Nov. Zool.* 1903. p. 226, 1907. p. 465.

3 ♂, 8 ♀; Mt. Goliath, up to 5000 ft., January and February 1911. (Nos. 5118, 5119, 5154, 5182, 5198, 5213, 5262, 5329, 5366, 5405, 5452, A. S. Meek Coll.)

As we have stated before, the males have a white, the females a buff superciliary line; moreover the males are larger, wings 84-87, females smaller, wings 79-81 mm.



148. *Eupetes castanonotus saturatus* Rothsch. & Hart.

*Eupetes castanonotus saturatus* Rothschild & Hartert, *Orn. Monatsber.* 1911. p. 157 (Snow Mountains).

5 ♂ ad., 3 ♀ ad., 1 ♂ med., 1 ♀ juv.; Snow Mountains, 2000 ft., August to October 1910. (Nos. 4624 (type), 4672, 4680, 4696, 4724, 4728, 4744, 4790, 4795, 4838, A. S. Meek Coll.)

Differs from *E. c. castanonotus* in having the underside of a deeper blue with a purplish tinge, and a deeper chestnut back. "Iris dark brown; bill and feet black." The young in first plumage has the upper surface brown; middle rectrices dark brown, throat greyish white, rest of underside dusky brown. The young male has the rump chestnut.

149. *Eupetes caeruleus nigricrissus* Salvad.

Cf. *Nov. Zool.* 1903. p. 230; van Oort, *Nova Guinea* ix. livr. i. p. 90 (Noord River).

4 ♂, 2 ♀; Upper Setekwa River, June to September 1910. (Nos. 4180, 4211, 4263, 4414, 4415, 4416, A. S. Meek Coll.)

3 ♂, 2 ♀; Upper Eilanden River, March 1911. (Nos. 5485, 5486, 5499, 5504, 5505, A. S. Meek Coll.)

✓ 150. *Eupetes leucostictus loriae* Salvad.

Cf. *Nov. Zool.* 1903. p. 230. 1907. p. 464.

♀; Mt. Goliath, 27. i. 1911 (No. 5212).

"Iris dark brown; bill and feet black." (No. 5212 A. S. Meek Coll.) As we have said before, the ♀ has the entire upper surface rufous chestnut, while in the males it is dull greenish olive. *E. l. loriae* is very closely allied to *E. l. leucostictus*, from which it seems to differ only by the black throat and guttural patch being more or less connected by black feathers with white edges; moreover, the black guttural patch has more or less round white spots to the tips of its feathers, which are not seen in the *E. l. loriae*. It appears to be a mistake to say that the chest is olive-greenish and not cinereous blue, as it is **not** always bluish in *E. l. leucostictus*.

151. *Pomatorhinus isidori* Less.

Cf. *Nov. Zool.* 1903. p. 231; van Oort, *Nova Guinea* ix. livr. i. p. 89.

1 ♂, 2 ♀; Lower Setekwa River, 17, 18. vi. 1910. (Nos. 4184, 4192, 4193, A. S. Meek Coll.)

3 ♀; Upper Setekwa River, July and November 1910. (Nos. 4280, 4339, 4972, A. S. Meek Coll.)

"Iris yellow, dull yellow, dull white, and brown!"

✓ 152. *Turdus (Geocichla) papuensis* (Seeb.).

*Geocichla papuensis* Seebohm, *Cat. B. Brit. Mus.* v. p. 158. pl. ix. (1881—S.E. New Guinea. Type in the British Museum, collected by A. Goldie).

♀ juv.; Snow Mountains, 3000 ft., 18. x. 1910. (No. 4849 A. S. Meek Coll.)

"Iris dark brown; bill black; feet light horn-colour."

Of this rare mountain-Thrush we have, besides some skins from the Upper Aroa

River, collected by Emil Weiske, at elevations of about 3500 feet, received a skin from the Sattelberg in German New Guinea, together with its nest and fragments of eggs; the latter are pale green with pale rufous spots, like small Blackbirds' eggs and many other eggs of *Turdi*.

✓153. *Artamus leucorhynchos leucopygialis* Gould.

Cf. *Nov. Zool.* 1903, p. 112; 1912, p. 292.

1 "♂," 2 ♀; Upper Setekwa River, July 1910. (Nos. 4368, 4374, 4452, A. S. Meek Coll.)

These three specimens agree with the race from S.E. Papua and Australia. Their wings measure only 122 and 125 mm. It seems doubtful if the birds from N.W. New Guinea can be separated, but they are generally slightly larger and have larger beaks.

✓154. *Artamus maximus* Mey.

Cf. *Nov. Zool.* 1903, p. 112.

♂; Mt. Goliath, 10. ii. 1911. (No. 5350, A. S. Meek Coll.)

✓155. *Pitohui aruensis nigrippectus* Oort.

*Pitohui aruensis nigrippectus* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 93 (1909—Sabang).

♂; Upper Setekwa River, 7. vii. 1910. (No. 4309, A. S. Meek Coll.)

4 ♂ ad.; 2 ♀ ad.; 2 ♂ ♀ juv.; Snow Mountains, 2000-3000 ft., August, September, October 1910. (Nos. 4616, 4740, 4742, 4773, 4774, 4785, 4786, 4928, A. S. Meek Coll.)

2 ♂, 1 ♀; Upper Eilanden River, March 1911. (Nos. 5483, 5484, 5504, A. S. Meek Coll.)

"Iris red, dark red, chocolate; bill and feet black, or bill black, feet dark slaty blue."

The differences of this new form are well described by Dr. van Oort; but, according to the sex-marks on our labels, the adult males only have the breast and part of abdomen pure black, while the adult females have the throat and jugulum black, the rest of the underside cinnamon-rufous. The lower rump and upper tail-coverts in all our specimens are black, more or less mixed with rufous-chestnut. In a young female (No. 4740) the crown is brown with black streaks, the throat cinnamon, towards the breast with an admixture of black. The tail, which is pure black in adult males and females, is margined with brown. In the young male in first plumage (No. 4774) the crown is dull cinnamon-brown, throat dull cinnamon-brown as far as the chest, rump and upper tail-coverts dark chestnut, the whole tail rufous-brown. Wings of the adult males 123-128, of the females 121-126. mm.

156. *Pitohui ferrugineus ferrugineus* (Bp.).

*Rectes ferrugineus* Bonaparte, *Compt. Rend. Paris.* xxxi, p. 563 (1850—Ex S. Müller MS. in Mus. Leiden. Terra typica: Lobo, Nova Guinea); van Oort, *Nova Guinea* ix., *Zool.*, livr. i, p. 94.

4 ♂ ♀; Upper Setekwa River, July 1910. (Nos. 4243, 4277, 4349, 4350, A. S. Meek Coll.)

♂ ♀; Snow Mountains, 2000 ft., August 1910. (Nos. 4613, 4644, A. S. Meek Coll.)

✓ 157. *Pitohui cristatus* (Salvad.).

Cf. *Nov. Zool.* 1903. p. 98.

2 ♂ ; Snow Mountains, 2000 ft., 27. ix., 6. x. 1910. (Nos. 4739, 4780, A. S. Meek Coll.)

No. 4780 agrees with our *P. cristatus* from various localities, while No. 4739 is much deeper rufous below and a little more rufescent above, than all other examples seen by us.

✓ 158. *Pitohui meeki* spec. nov.

(Perhaps subspecies of *P. nigrescens*.)

♀ ad. Upperside rufous brown, head more brownish. Quills deep brown, outer webs ferruginous brown, inner webs widely margined with bright ferruginous towards the base. Tail chestnut brown, shafts brighter and more reddish. Whole underside brownish rust-colour, under wing-coverts light ferruginous.

Iris dark brown ; bill and feet black. Wings 125·5, tail 103, culmen from base of forehead 30·5, tarsus 31·5 mm.

Type and only specimen received : ♀ ad. Mount Goliath, 7. ii. 1911. (No. 5321, A. S. Meek Coll.)

This bird belongs to the group called "*Melanorhectes*," as is not only proved by its general appearance and fluffy plumage, but also by the peculiar musky smell, which is peculiar to *Pitohui* (*Melanorhectes*) *nigrescens nigrescens* and *schistaceus*. It differs from the adult females of these two forms by its much more rufous colour, thus somewhat resembling the young birds ; but it is not so bright ferruginous, and is evidently an old bird. More material must be compared before we can decide whether it is a representative of *P. nigrescens*, or a separate species, and how the male looks.

✓ 159. *Pinarolestes megarhyncha megarhyncha* (Quoy & Gaim.).

Cf. *Nov. Zool.* 1903. p. 99 ; van Oort, *Nova Guinea* ix. *Zool.*, livr. i. p. 94.

5 ♂ ♀ ad. ; Upper Setekwa River, July 1910. (Nos. 4257, 4328, 4329, 4370, 4371, A. S. Meek Coll.)

4 ♂ ♀ ad. ; Snow Mountains, 2000 and 2500 ft., August 1910. (Nos. 4575, 4587, 4598, 4685, A. S. Meek Coll.)

These specimens appear to be quite typical *megarhyncha*.

✓ 160. *Cracticus cassicus* (Bodd.).

Cf. *Nov. Zool.* 1903. p. 92.

♂ ad., ♂ jun., ♀ ad. ; Upper Setekwa River, July and September 1910. (Nos. 4260, 4267, 4526.)

3 ♂ ; Snow Mountains, 2000 ft., 9. x. 1910. (Nos. 4799, 4800, 4801.)

✓ 161. *Cracticus quoyi quoyi* (Less.).

Cf. *Nov. Zool.* 1903. p. 93.

♀ ; Upper Setekwa River, 27. vii. 1910. (No. 4434.)

✓ 162. *Pachycephala tenebrosa* Rothsch.

*Pachycephala tenebrosa* Rothschild, *Bull. B.O. Club* xxix. p. 20 (Nov. 1911—Mt. Goliath).

9 ♂ ♀ ; Mt. Goliath, January and February 1911. (Nos. 5135, 5224, 5246, 5320, 5334, 5343, 5344, 5394 [type], 4416, A. S. Meek Coll.)

There is hardly anything to add to the original description, though the colour of the upperside is browner in some, darker and more blackish in others. The species is not quite a typical *Pachycephala*; it approaches, in fact, the genus *Pinarolestes*, in the copious and fluffy plumage on the back and rump, but the bill is much deeper, in fact exactly like that of other typical *Pachycephalae*.

Wings of the males 93–96, females 90–92 mm.

163. *Pachycephala rufinucha gamblei* Rothsch.

Cf. *Nov. Zool.* 1903. p. 104 ; 1907. p. 471.

6 ♂ ♀ ad., 1 ♂ immat., 1 ♀ juv. ; Mt. Goliath, January and February 1911. (Nos. 5095, 5264, 5313, 5314, 5315, 5330, 5385, 5390, A. S. Meek Coll.)

The curious plumage of the young birds and the differences from *P. r. rufinucha* have been described as quoted above. This species approaches *Pachycephala tenebrosa* in the fluffy plumage of the back and rump, thus connecting it with the true *Pachycephala*.

✓ 164. *Pachycephala soror* Schl.

Cf. *Nov. Zool.* 1903. p. 103 ; 1907. pp. 470, 471.

♀ immat. ; Snow Mountains, 2000 ft., 26. viii. 1910. (No. 4641, A. S. Meek Coll.)

7 ♂ ad., 3 ♀ ad., 2 ♂ ♀ immat. ; Mt. Goliath, January and February 1911. (Nos. 5094, 5185, 5186, 5215, 5216, 5217, 5241, 5270, 5310, 5356, 5414, 5446, A. S. Meek Coll.)

The first plumage in which these birds leave the nest has apparently not yet been described; the immature specimens have cinnamon edges to the quills and upper wing-coverts, and a few cinnamon-rufous feathers on the back and abdomen, showing that the foregoing plumage must have been cinnamon-rufous. Their heads are dull cinnamonous-brown.

✓ 165. *Pachycephala schlegelii schlegelii* Schleg.

Cf. *Nov. Zool.* 1903. p. 103.

3 ♀ ad. ; Mt. Goliath, January 1911. (Nos. 5108, 5147, 5438, A. S. Meek Coll.)

It is interesting to find on Mt. Goliath—as in several other cases—the Arfak race, and not the one inhabiting British New Guinea.

✓ 166. *Pachycephala aurea* Rehw.

Cf. *Nov. Zool.* 1903. p. 102.

5 ♂, 1 ♀ ; Upper Setekwa River, July, September, November 1910. (Nos. 4387, 4528, 4529, 4540, 4965, 4993, A. S. Meek Coll.)

“ Iris chocolate-brown ; bill black ; feet slate-colour.”

The adult males vary somewhat in the colour of the back, which is sometimes brighter, sometimes paler, and in a few cases washed with olive. More conspicuous, however, are the variations of the throat, which has in some specimens only a tiny white spot, while in other specimens nearly the whole throat is white. The female

has apparently not been described. The feathers of the crown and nape are widely margined with olive-grey; throat white; the feathers of the wide jugular black band have yellowish tips; the feathers of the back are yellowish olive. Quills dull black, primaries outwardly margined with grey, secondaries and upper wing-coverts with dull olive-green; tail black, mottled with olive-green.

Wings only 80 mm., those of the males 85-88 mm.

The males agree perfectly with those from the mountains of British New Guinea.

✓ 167. *Pachycephala leucostigma* Salvad.

Cf. *Nov. Zool.* 1903. p. 107; 1907. p. 473.

♂ ad., 3 ♀ (two not fully adult), 1 quite young; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5129, 5251, 5267, 5403, 5444, A. S. Meek Coll.)

The adult male was described by us in 1907, but it must be added that the adult female has the crown almost uniform olive-grey, the forehead only being adorned with white streaks. The very young bird (No. 5251), just from the nest, agrees with other young, though older, birds. These birds are absolutely identical with those from the mountains of British New Guinea, but it is desirable to have a good series of fresh Arfak specimens to compare.

✓ 168. *Pachycephala poliosoma* (Sharpe).

Cf. *Nov. Zool.* 1907. p. 473.

*Pachycephala poliosoma approximans* Ogilvie-Grant, *Bull. B.O. Com.* xxix. p. 26 (Twak River, foot of Snow Mountains).

5 ♂ ♀ ad.; Snow Mountains, 2000 and 2500 ft., August and October 1910. (Nos. 4562, 4566, 4567, 4618, 4792, A. S. Meek Coll.)

Mr. Ogilvie-Grant distinguished his new form, stating that it differed from specimens from the Aroa and Mambare Rivers in having the top of the head and ear-coverts very dark slate-grey like the rest of the upper parts, while in *P. poliosoma poliosoma* these parts were washed with brown, and that the foreneck and chest were uniform dark grey, not washed with brown. These alleged differences are, we are sorry to say, not constant at all, when comparing the Snow Mountain birds with our twenty specimens from British Papua. Not only are the alleged distinguishing characters of the birds from the Snow Mountains not equally seen in all the specimens, but they are also evident in several adult males in fresh plumage from British New Guinea.

✓ 169. *Pachycephala griseiceps* Gray (? subsp.).

*Pachycephala griseiceps* Gray, *Proc. Zool. Soc. Lond.* 1858. p. 178, 192 (Aru Islands).

5 "♂"; Snow Mountains, 2000-3000 ft., August and October 1910. (Nos. 4607, 4619, 4643, 4791, 4903, A. S. Meek Coll.)

These five specimens show the dark shaft-lines to the feathers of the underside, especially of the throat, chest, and breast, very conspicuously; in this respect they are most nearly approached by some of the birds from the Upper Aroa River in British New Guinea, but also some Aru birds—Aru being the typical locality—show distinct stripes, and our Aru examples being inferior skins, as compared with those of Mr. Meek, a very close comparison is somewhat difficult. It appears, however, that the skins from Kapaur (cf. *Nov. Zool.* 1901. p. 56, 1903. p. 105)

are more yellowish on the abdomen and under tail-coverts, and hardly ever show any striping on the under surface. They might therefore be separated under the name of *P. griseiceps squalida* Onustalet (*Bull. Soc. Philomat. Paris* 1877-1878. p. 56—terra typica Amberbaki, Berau Peninsula). The birds from Waigin and Misol (Mysol) might be united with *squalida*, though some—and perhaps the majority—of the latter show again distinctly the dark shaft-stripes on the feathers of the throat and breast.

✓ 170. **Eulacestoma nigropectus** De Vis.

*Eulacestoma nigropectus* De Vis, *Report on New Guinea* 1893-94, Ornith. Specimens. p. 4 (1894—Mt. Manaëo, Brit. New Guinea).

*Eulacestoma nigritorques* (evidently slip of pen) Ogilvie-Grant, *Bull. B.O. Club* viii. 1898. p. x.

*Eulacestoma nigripectus* Sharpe, *Handlist B.* iv. p. 314 (1903).

*Eulacestoma nigropectus* Sclater, *Ibis* 1904. pp. 373-5. pl. ix.

♂ ad., 1 juv.; Mt. Goliath, 19. ii. 1911. (Nos. 5420, 5421, A. S. Meek Coll.)

1 ♂ ad., 2 ♀ ad.; Avera, Aroa River, May 1903. (Nos. A477, 528, 529, A. S. Meek Coll.)

♂ ad.; Bihagi, head of Mambare River, 31. iii. 1906. (No. A2691, A. S. Meek Coll.)

“Iris dark brown; bill black in the ♂, horn-colour, light at base of lower jaw in the ♀, light horn throughout in the young bird.”

The bill varies much in size, that of the male from Bihagi being much larger. Wings of the adult males 68-70, females 70-70.5 mm. The wings are outwardly margined with olive-rufous in the adult females, the chest shows faint whitish cross-bars. In the young bird (No. 5420) the cross-markings of the chest are more distinct, and the upper wing-coverts as well as the margins of the secondaries are bright ferruginous.

(On one of the skins in the British Museum is a MS. name by Professor Reichenow, which has never been published.)

✓ 171. **Pachycare flavogrisea subaurantia** Rothsch. & Hart.

*Pachycare flavogrisea subaurantia* Rothschild and Hartert, *Orn. Monatsber.* xix. p. 157 (Oct. 1911—Snow Mountains).

5 ♂ ad., 2 ♀ ad., 1 ♀ juv.; Snow Mountains, 3000 ft., October and November 1910. (Nos. 4848, 4873 [type], 4885, 4895, 4935, 4936, 4941, 4946, A. S. Meek Coll.)

This brilliantly coloured form differs from *Pachycare flavogrisea flavogrisea* by the deeper and more orange colour of the underside and sides of the head. In the very young female (No. 4941) the colours are paler. Wings of the males 65-68, females 64-67 mm.

We have also received a female of *Pachycare flavogrisea* from an elevation of 1200 m. in the Rawlinson Mountains, German New Guinea, together with nest and eggs. This bird appears to be very orange underneath, and may belong to *P. f. subaurantia*, but it is so badly skinned that one can hardly be quite certain whether it belongs to *P. f. flavogrisea* or *P. f. subaurantia*. The two eggs are rather pointed, and in colour look exactly like small eggs of a *Pycnonotus*. Their ground-colour is whitish pink, and they are covered all over with rufous pink spots and patches. They measure about 21 × 15 mm., but being end-blown (with rather big holes) their length is not absolutely certain. The nest is a large structure

of fibres and decayed leaves, wrapped up in fresh leaves. Its original shape is uncertain, but it seems to be a cave about 10 cm. deep, narrowing below; the entrance has apparently been at the top.

✓ 172. *Dicaeum geelvinkianum diversum* R. & H.

*Dicaeum geelvinkianum diversum* Rothschild and Hartert, *Nov. Zool.* 1903. p. 215 (Ambernoh River); van Oort, *Nova Guinea* ix., livr. i. p. 98.

“ ♀ ”; Setekwa River, 20. vi. 1910. (No. 4201, A. S. Meek Coll.)

(One red feather on chest.)

♂ ♀; Upper Setekwa River, 30. vii., 9. viii. 1910. (Nos. 4450, 4490, A. S. Meek Coll.)

3 ♂; Snow Mountains, 2000—3000 ft., September and October 1910. (Nos. 4688, 4702, 4861, A. S. Meek Coll.)

“ Iris dark brown; bill and feet black.”

✓ 173. *Pristorhamphus versteri meeki* Rothschild & Hart.

*Pristorhamphus versteri meeki* Rothschild and Hartert, *Bull. B.O. Club* xxix. p. 36 (1911—Mt. Goliath).

6 ♂ ad., 3 ♂ juv., 6 ♀; Mt. Goliath, about 5000 ft., January and February 1911. (Nos. 5106, 5136, 5155, 5173, 5174, 5193, 5199, 5214, 5255, 5332, 5333, 5355, 5362, 5404, 5441, A. S. Meek Coll.)

♂ ♀: “ Iris dark brown; bill and feet black.”

This form differs in the male sex from *P. v. versteri* in the darker colour of the underside, and the greater extent of white at the base of the rectrices: the tails measure 75–79 mm.

(The type is No. 5332, Mt. Goliath, 8. ii. 1911.)

The curious fact that the females of *Pristorhamphus* are larger than the males has been mentioned before, *Nov. Zool.* 1903. p. 217.

✓ 174. *Melanocharis nigra chloroptera* Salvad.

Cf. *Nov. Zool.* 1903. p. 216, 1907. p. 477.

4 ♂, 2 ♀; Upper Setekwa River, June and July 1910. (Nos. 4188, 4253, 4299, 4358, 4399, 4412, A. S. Meek Coll.)

We can see no difference from Aru Islands specimens, unless that in some—but not all,—specimens the bill appears to be slightly more slender; colour and dimensions agree in every way.

✓ 175. *Melanocharis striativentris* Salvad.

Cf. *Nov. Zool.* 1907. p. 478.

♀; Snow Mountains, 2500 ft., 10. ix. 1910. (No. 4591, A. S. Meek Coll.)

“ Iris brown; feet slaty blue; bill smoky dark brown.”

✓ 176. *Rhamphocharis crassirostris* Salvad. (?).

*Rhamphocharis crassirostris* Salvadori, *Ann. Mus. Civ. Genova* vii. p. 943 (1875—Arfak); id. *Orn. Pap.* ii. p. 288. Sharpe, *Cat. B. Birds Brit. Mus.* x. p. 84; id. in Gould's *B. New Guinea*, part xx. (vol. iv. pl. ix.) and text.

♂; Mt. Goliath, 20. ii. 1911. (No. 5425, A. S. Meek Coll.)

Agrees in every way with the type of *Rh. crassirostris* in the Genoa Museum,

except that the base of the lateral rectrices is white for about 1 cm., as in *Rh. maculata*. Wing 68.2 mm.

"Iris dark brown; bill and feet black."

♂ juv.; Mt. Goliath, 14. ii. 1911. (No. 5383, A. S. Meek Coll.)

Back olive-green, with some white dots to the tips of the feathers.

♂ pull.; Mt. Goliath, 12. ii. 1911. (No. 5360, A. S. Meek Coll.)

This is quite a young bird, with the back uniform olive-green without white dots, underside creamy white with longitudinal grey spots. It is of course not quite certain that this bird belongs to *Rh. crassirostris*, but we have little doubt that our identification is correct.

✓ 177. *Oreocharis arfaki* (Meyer).

5/ Cf. *Nor. Zool.* 1903, p. 474.

7 ♂ ad., 5 ♀; Mt. Goliath, January and February 1911. (Nos. 5088, 5107, 5152, 5170, 5171, 5187, 5206, 5254, 5406, 5415, 5433, 5435, A. S. Meek Coll.)

✓ 178. *Cinnyris aspasia aspasia* Less.

7/ Cf. *Nor. Zool.* 1903, p. 475; van Oort, *Nova Guinea* ix., livr. i. p. 94.

♂; Lower Setekwa River, 22. xi. 1910. (No. 5024, A. S. Meek Coll.)

4 ♂, 3 ♀; Upper Setekwa River, July and August 1910. (Nos. 4261, 4441, 4442, 4480, 4509, 4510, 5001, A. S. Meek Coll.)

1 ♂ ad., 1 ♂ juv.; Upper Eilanden River, 8, 9. iii. 1911. (Nos. 5506, 5507, A. S. Meek Coll.)

✓ 179. *Myzomela eques nymani* Rothschild & Hart.

*Myzomela eques nymani* Rothschild and Hartert, *Nor. Zool.* 1903, p. 223 (Simbang in German New Guinea [terra typica] and British New Guinea).

♂; Upper Setekwa River, 5. viii. 1910. (No. 4475, A. S. Meek Coll.)

5 ♂; Snow Mountains, 2000 ft., October 1910. (Nos. 4814, 4828, 4831, 4835, 4836, A. S. Meek Coll.)

It would be desirable to compare a series from Simbang, as well as well-prepared fresh skins from Waigiu (terra typica of the name *eques*) and N.W. Papua. The specimens from British New Guinea are absolutely identical with those from the Setekwa River; they are darker than typical *eques*, but can hardly be said to be more greyish.

✓ 180. *Myzomela rosenbergi* Schleg.

Cf. *Nor. Zool.* 1903, p. 220.

♂ juv.; Snow Mountains, 2000 ft., 1. ix. 1910. (No. 4689, A. S. Meek Coll.)

6 ♂ ad., 5 ♀; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5087, 5091, 5098, 5101, 5102, 5116, 5168, 5188, 5285, 5442, 5448, A. S. Meek Coll.)

✓ 181. *Myzomela cruentata cruentata* A. B. Mey.

Cf. *Nor. Zool.* 1903, p. 222; 1907, p. 479.

1 ♂ ad., 2 ♂ juv., 3 ♀; Snow Mountains, 2000 ft., August and September 1910. (Nos. 4657, 4674, 4675, 4677, 4678, 4691, A. S. Meek Coll.)



182. *Myzomela nigrita nigrita* Gray.

Cf. *Nov. Zool.* 1903. p. 221.

4 ♂ ad., 2 ♀; Snow Mountains, 2000 ft., August, September, October, November 1910. (Nos. 4656, 4692, 4693, 4837, 4915, 4938, A. S. Meek Coll.)

We cannot see differences from specimens from Aru, which is the terra typica for the name *nigrita*, but should any be found, the name *meyeri* (Salvadori, *Orn. Pap.* ii. p. 292, in the text), which replaces *erythrocephala* A. B. Meyer, nec Gould, would be available for the Papuan race. *M. n. pluto* is a much larger bird.

✓ 183. *Oedistoma pygmaeum pygmaeum* Salvad.

Cf. *Nov. Zool.* 1903. p. 436.

3 ♂ ♀; Upper Setekwa River, August 1910. (Nos. 4474, 4476, 4483, A. S. Meek Coll.)

2 ♂; Snow Mountains, 2000 ft., 23, 26. viii. 1910. (Nos. 4614, 4646, A. S. Meek Coll.)

We would now regard *O. meeki* (Hart.) as a subspecies of *pygmaeum* and call it *O. pygmaeum meeki*. Cf. *Nov. Zool.* 1903. p. 436.

✓ 184. *Melilestes iliolophus iliolophus* Salvad.

Cf. *Nov. Zool.* 1903. p. 438.

1 ♂, 2 ♀; Upper Setekwa River, July and August 1910. (Nos. 4271, 4355, 4458, A. S. Meek Coll.)

2 ♂, 1 ♀; Snow Mountains, 2500 and 3000 ft., August and October 1910. (Nos. 4595, 4596, 4853, A. S. Meek Coll.)

It would be desirable to have freshly collected and good skins from Miosnom and Arfak to compare with Mr. Meek's beautiful specimens, which, together with others from British New Guinea, look very greenish compared with old Arfak skins.

✓ 185. *Melilestes novaeguineae flaviventris* Rothsch. & Hart.

*Melilestes novaeguineae flaviventris* Rothschild and Hartert, *Bull. B.O. Club* xxvii. p. 44 (Aru Islands).

♀; Upper Eilanden River, 7. iii. 1911. (No. 5500, A. S. Meek Coll.)

2 ♂, 2 ♀; Snow Mountains, 2000-3000 ft., August, September, October 1910. (Nos. 4569, 4709, 4843, 4912, A. S. Meek Coll.)

"Iris brown, dark brown; bill black; feet slaty blue." Wing, males 68, 68.5, females 58-60.5 mm.

These birds agree well with the topotypical Aru specimens.

✓ 186. *Melilestes megarhynchus megarhynchus* (Gray).

Cf. *Nov. Zool.* 1903. p. 436; 1912. p. 203; van Oort, *Nova Guinea* ix., *Zool.* livr. i. p. 95.

2 ♂, 2 ♀ ad.; Upper Setekwa River, July 1910. (Nos. 4321, 4426, 4435, 4443, A. S. Meek Coll.)

1 ♂ ad., 1 ♂ juv.; Snow Mountains, 2000 ft., August 1910. (Nos. 4658, 4673, A. S. Meek Coll.)

✓ 187. *Philemon novaeguineae brevipennis* subsp. nov.

Differs from *P. novaeguineae novaeguineae*, *P. novaeguineae jobiensis*, and *P. novaeguineae subtuberosus* in having shorter wings and slenderer beaks. Wings of males 143-146, of females 136-140 mm.

*Hab.* Snow Mountains, Dutch New Guinea; type No. 4713, Snow Mountains, 4. ix. 1910, A. S. Meek Coll.

1 ♂, 2 ♀; Snow Mountains, 2000 ft., September 1910. (Nos. 4687, 4713, 4714, A. S. Meek Coll.)

2 ♂, 1 ♀; Upper Setekwa River, July 1910. (Nos. 4410, 4431, 4432, A. S. Meek Coll.)

The *Philemon novaeguineae* is a very interesting species from the point of its geographical variation. In 1903 (*Nov. Zool.* 1903. pp. 449, 450) we acknowledged three subspecies: *P. novaeguineae novaeguineae*, *subtuberosus*, and *jobiensis*, and in 1912 (*Nov. Zool.* xix. pp. 204, 209) we quoted *P. novaeguineae novaeguineae* from the Kumusi River and Haidana, Collingwood Bay. The discovery of a new form on the lower slopes of the Snow Mountains led us to reconsider these forms, and we came to the following conclusions:

*P. novaeguineae novaeguineae* extends from the Berau Peninsula (Arfak, Dorey, Sorong, etc.) to Ron Island, Batanta, Waigiu and Mysol.—In 1903 we united with it the Aru birds, and two examples said to have come from "Mt. Maori" (Humboldt Bay) and the Ambernoh River. We must modify our views of 1903 somewhat, on account of more material received and of a more careful study.

✓ *P. novaeguineae aruensis* A. B. Mey. From a renewed comparison of a large series we are inclined to separate the Aru form because the heads are after all generally much paler, and the knobs at the base of the culmen reach often a size which is never developed in *P. n. novaeguineae*.

*P. novaeguineae jobiensis* A. B. Mey. Jobi Island and along the north coast of New Guinea east of Geelvink Bay to German New Guinea (Konstantinhafen, Stephansort).

*P. novaeguineae brevipennis* R. & H. Besides the specimens from the Snow Mountains and Upper Setekwa River the following appear to belong to this form:

Two males from Hall Bay, collected by D'Albertis, being specimens f<sup>3</sup> and g<sup>3</sup> of Salvadori's list in *Orn. Pap.* ii. p. 360. These two birds are too light and too small for *P. n. subtuberosus*, but their wings are longer than in our *P. n. brevipennis* from the Snow Mountains, measuring 147 and 150 mm.—An unsexed specimen said to be from the Ambernoh River, and another said to be from "Mt. Maori," near Humboldt Bay. The wings of these birds measure only 146 mm., and they agree otherwise with our *P. n. brevipennis*. They were mentioned in *Nov. Zool.* 1903. p. 449. They have been collected by Mr. J. Dumas, but were not received direct, but through Mr. van Duivenbode, and their locality was given by word, as they were unlabelled.

*P. novaeguineae subtuberosus* Hart. Originally described from Fergusson Island. Differing in the small hump at the base of the culmen, and the generally duller colour, especially the more brownish underside. The specimens from the Kumusi River and Collingwood Bay mentioned in *Nov. Zool.* xix. pp. 204, 209 agree best with *P. n. subtuberosus*, and not with *P. novaeguineae novaeguineae*; the two from the Kumusi River might very well be united with *P. n. subtuberosus*, but the two from Collingwood Bay have larger knobs than any from Fergusson Island, though small for typical *novaeguineae*.

✓ 188. **Melirrhophetes belfordi griseirostris** Rothschild & Hart.

*Melirrhophetes belfordi griseirostris* Rothschild and Hartert, *Bull. B.O. Club* xxix. p. 34 (December 1911)—Mt. Goliath, type No. 5353, A. S. Meek Coll.)

6 ♂, 4 ♀; Mt. Goliath, January and February 1911. (Nos. 5093, 5148, 5161, 5222, 5248, 5298, 5325, 5353, 5354, 5455, A. S. Meek Coll.)

" Iris dark brown ; bill and feet pale slaty-blue."

This is a smaller form than *M. belfordi belfordi*, with the beak pale slaty-blue, instead of black. Wings of males 130-134, females 122-124 mm. Nearly all the specimens, however, show some moult.

✓ 189. *Melipotés gymnops goliathi* Rothsch. & Hart.

*Melipotés gymnops goliathi* Rothschild and Hartert, *Bull. B.O. Club* xxix. p. 34 (1911—Mt. Goliath, type No. 5221, A. S. Meek Coll.).

5 ♂, 3 ♀ ; Mt. Goliath, about 5000 ft., January and February 1911. (Nos. 5086, 5142, 5189, 5221, 5341, 5363, 5364, 5458, A. S. Meek Coll.)

" Iris dark brown ; bill black ; feet slaty-blue."

This form is nearest to *M. g. fumigatus* A. B. Meyer, from British New Guinea, but differs in having the hindneck and back deep brownish black, instead of blackish olive, in having darker centres to the feathers of the breast, and being slightly larger. The typical *gymnops* has a totally different underside. Wing in the males up to 117, in the females 109-111 mm.

✓ 190. *Timeliopsis fulvigula meyeri* (Salvad.).

(*Euthyrhynchus* auct.).

[*Euthyrhynchus fulvigula* Schlegel, *Ned. Tijdschr. Dierkunde* iv. p. 40 (1871—New Guinea. Types from the Arfak region).]

*Euthyrhynchus fulvigula meyeri*, *Nov. Zool.* 1903. p. 451.

3 ♂ ; Mt. Goliath, January, February 1911. (Nos. 5138, 5229, 5300, A. S. Meek Coll.)

" Iris light yellowish brown, dull brownish yellow, pale chocolate ; bill dark horn-colour ; feet dull slaty-blue."

These specimens agree with ours from British New Guinea, but we have no examples from the Arfak region. Wings 77 to 79.5 mm.

✓ 191. *Ptilotis diops* Salvad.

*Ptilotis diops* Salvadori, *Ann. Mus. Civ. Genova* xxxix. (ser. 2. vol. xix) p. 581 (1899—" Hab. in Nova Guinea orientali-meridionali, ad ripas fluminis Purari ").

♂ ♀ ad. ; Upper Setekwa River, 8. vii., 11. x. 1910. (Nos. 4317, 4976, A. S. Meek Coll.)

" Iris dark brown ; bill black ; feet pale slaty-blue."

We have also received a male from the Aicora River, near the frontier of German New Guinea, in the utmost N.E. of British New Guinea.

✓ 192. *Ptilotis erythropleura lorentzi* Oort.

[*Ptilotis erythropleura* Salvadori, *Ann. Mus. Civ. Genova* vii. 1875. p. 949—Arfak.]

*Ptilotis erythropleura lorentzi* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 95 (1909—Hellwig Mountains).

*Ptilotis praecipua nigritergum* Rothschild & Hartert, *Bull. B.O. Club* xxix. p. 35 (January 1911—Mt. Goliath).

3 ♂, 2 ♀ ; Mt. Goliath, January 1911. (Nos. 5089, 5103, 5143, 5449, 5450, A. S. Meek Coll.)

When describing *P. praecipua nigritergum* we were not acquainted with *P. erythropleura* from Arfak, and thus it happened that we overlooked the fact

that the new form had already been described by Dr. van Oort. Dr. van Oort has compared our specimens with his series and finds them perfectly similar.

Thus *P. erythropleura* consists at present of three distinct subspecies :

1. *Ptilotis erythropleura erythropleura* Salvad. : Arfak.
2. *Ptilotis erythropleura praecipua* Hart. : Mountains of British New Guinea.  
(Cf. *Nov. Zool.* 1897. p. 370, 1903. p. 443.)

3. *Ptilotis erythropleura lorentzi* Oort : Hellwig and Goliath Mountains in Central Dutch New Guinea.

"Iris green ; bill black ; feet slaty-blue." Wings, ♂ 97-100, ♀ 87-90 mm.

√ 193. *Ptilotis cinerea marmorata* Sharpe.

Cf. *Ptilotis cinerea*, *Nov. Zool.* 1903. p. 444.

♂ ♀ ; Snow Mountains, 3000 ft., October, November 1910. (Nos. 4852, 4929, A. S. Meek Coll.)

In 1903 we have shown that *P. marmorata* is the same species as *P. cinerea*, but now, though we are badly in want of fresh material from the Arfak region, we consider that two subspecies, *P. cinerea cinerea* and *P. cinerea marmorata*, should be distinguished. The Arfak form is browner, less olive, on the upperside, and the juvenile plumage is more uniform in the latter, a little more spotted in *P. c. marmorata*.

√ 194. *Ptilotis chrysothis saturatior* Rothschild & Hart.

*Ptilotis chrysothis saturatior* Rothschild & Hartert, *Nov. Zool.* 1903. p. 445 (Aru Islands).

*Ptilotis chrysothis filigera* van Oort, *Nova Guinea* ix., *Zool.*, livr. i. p. 97 (1909—Noord River, Sabang, Alkmaar, Resi Mountains).

♀ ; Upper Eilanden River, 7. iii. 1911. (No. 5496, A. S. Meek Coll.)

♂ 3, ♀ 1 ; Upper Setekwa River, July 1910. (Nos. 4262, 4302, 4315, 4340, A. S. Meek Coll.)

♂ 1, ♀ 2 ; Snow Mountains, 3000 ft., September and October 1910. (Nos. 4722, 4819, 4908, A. S. Meek Coll.)

We cannot separate these birds from *P. c. saturatior* of the Aru Islands, while we find them distinctly browner than *P. c. filigera*, less greenish on the upperside, especially the rump, darker on the crown and generally more uniform on the underside. In the mountains of British New Guinea the species is represented by *P. chrysothis visi* Hart.

√ 195. *Ptilotis aruensis aruensis* Sharpe.

*Ptilotis aruensis* Sharpe, *Zool. Coll. Alert* p. 19 (1884—Aru).

*Ptilotis aruensis aruensis* Rothschild & Hartert, *Nov. Zool.* 1903. p. 442.

*Ptilotis flavirictus* van Oort (non Salvadori!) *Nova Guinea* ix., *Zool.*, livr. i. p. 96 (1909—Noord River).

♂ 2 ad. ; Upper Setekwa River, 9. vii., 9. viii. 1910. (Nos. 4333, 4486, A. S. Meek Coll.)

These two skins agree perfectly with typical *aruensis*. We do not know why Dr. van Oort preferred the name *flavirictus* for *P. aruensis*. We have, through the kindness of Dr. Gestro, been able to compare the type of *P. flavirictus*, which has indeed nothing to do with *P. aruensis*, but which we consider to be merely a young *P. analoga*!

✓196. *Ptilotis analoga analoga* Rehb.

*Ptilotis analoga* Reichenbach, *Handb. spec. Orn.* "Meropinae," p. 103. pl. 467 (1852—Ex "Ptilotis analogue" Hombron and Jacquinot, *Voy. Pôle Sud*, pl. xvii. Terra typica: "W. coast of New Guinea").

*Ptilotis analoga analoga* Rothschild and Hartert, *Nov. Zool.* 1903. p. 441.

"♂," but obviously ♀, the wing measuring only 76 mm.; Merauke, 4. vi. 1910 (A. S. Meek Coll., without number).

♂ jun.; Snow Mountains, 2. ix. 1910. (No. 4698, A. S. Meek Coll.)

Through the kindness of Professor Trouessart we have been able to compare the type of the "Ptilotis analogue," which is also the type of *Ptilotis similis* Jacquinot and Pucheran, and of *P. analoga* Reichenbach, and we find it to agree with the birds we used to call *Ptilotis analoga*. The wings of the males measure apparently 80–87 and sometimes even 90 mm., those of the females 72–77 mm. We say "apparently," as so many of our birds are evidently wrongly sexed, that we had to correct the sexes in many cases, but in any case the wings vary from 72 to 87, and even 90 mm.

With these birds, the real *P. analoga analoga*, we used to unite the Cape York bird, *i.e.* Gould's *P. notata*, but this was not correct.

The Cape York Peninsula is inhabited by birds with much stouter beaks and feet and an indistinctly streaked or mottled, not quite uniform, under-surface; the feathers have grey shaft-stripes. The wings measure: 80–87 mm., those with wings of 80–82 evidently being females, those with 87 males. This is Gould's *P. notata*, and it must be kept separate, though we are by no means sure that it is a subspecies of *analoga*, and it will be safer not to call it so at present.

Together with *Ptilotis notata* we find a smaller form, Gould's *P. gracilis*, which differs from *P. notata* by its smaller size, finer bill and feet, a uniform under-side and paler upper surface. The wings measure, ♂ 76, females 70–72 mm. These birds must be a subspecies of *P. analoga*. They are, in fact, in some cases almost indistinguishable, though it seems that they are generally paler on the upperside, and never reach the size of adult males of *P. analoga*.

✓197. *Ptilotis mimikae* Grant.

*Ptilotis mimikae* Ogilvie-Grant, *Bull. B. O. Club* xxix. p. 27 (Mimika River, foot of Snow Mountains).

♂, ♀, ♀ immat.; Snow Mountains, October 1910. (Nos. 4850, 4869, 4900, A. S. Meek Coll.)

1 ♂ ad., 2 ♀ ad., 1 ♀ immat.; Upper Setekwa River, July 1910. (Nos. 4294, 4332, 4356, 4357, A. S. Meek Coll.)

"Iris dark brown or ashy grey; bill black; feet slaty-blue."

These birds are curiously near to *P. orientalis* A. B. Meyer, but differ by their larger size and comparatively stouter and less elongated bills. The wings of our adult males measure only 78.5 and 88 mm., while that of the (apparently exceptionally large) ♂ from the Upper Aroa River (cf. *Nov. Zool.* 1907, p. 482) has a wing of 96 mm., but Mr. Ogilvie-Grant measures the wings of his male examples 81–91 mm.

We have also received two females from the Upper Setekwa River, 4. and 12. vii. 1910 (Nos. 4273 and 4345, A. S. Meek Coll.). Both are apparently not quite adult. They agree with the females of *Ptilotis mimikae* in size, colour of upperside and

wings, but are not quite so distinctly mottled underneath; this latter may be due to their immaturity. Both these birds have, however, the auricular patch and subocular line white, instead of yellow. These specimens are probably aberrations of *P. mimikae*. They do not have the heavy bills, brown outer webs to the primaries and tail, and brownish upperside of *Ptilotis montana*, which appears to have always white or whitish yellow auricular patches. We know, however, that among *Ptilotis analoga* sometimes aberrations with white, instead of yellow, auricular patches occur, the so-called *albonotata* of Salvadori. We are, therefore, of opinion that the skins Nos. 4273 and 4345 are aberrational *Ptilotis mimikae*, and nothing else.

#### 198. *Ptilotis orientalis* A. B. Meyer.

*Ptilotis orientalis* A. B. Meyer, *Journ. f. Orn.* 1894. p. 92 (S.E. New Guinea, exact locality not known).

*Ptilotis analoga orientalis* Rothschild & Hartert, *Nov. Zool.* 1903. p. 441.

1 ♂, 2 ♀; Snow Mountains, 2000 and 3000 feet, August and October 1910. (Nos. 4639, 4893, 4910, A. S. Meek Coll.)

“Iris light bluish grey, steel grey, light brown; bill black; feet pale blue or slaty blue.”

We had also a dozen skins from Avera and Bihagi on the Upper Aroa and Mambare Rivers, which, by some oversight, were not mentioned in our lists in *Nov. Zool.* 1907 and 1912.

The wings of the males measure 75—76·5, those of the females 69·5—72 mm.

Formerly we thought that *Ptilotis orientalis* was a subspecies of *Ptilotis analoga*, but this idea was no doubt erroneous, as both species occur together in several places, and the mottled underside, thin, comparatively elongated bill, and small size, distinguish *P. orientalis* rather conspicuously.

[In *Bull. B.O. Club* xxix. p. 28, Mr. Ogilvie-Grant gave a short review of the species of *Ptilotis* of the group similar to *Ptilotis analoga*. According to this review it would appear that the status of these birds is exceedingly simple; which, however, is by no means the case. It is, nevertheless, true that in many parts of New Guinea, as in Queenslaud, a smaller species occurs side by side with a larger one with stouter bill.

Thus we have in Queensland *P. notata* and *P. gracilis*, in the Snow Mountains and parts of the mountains of British New Guinea *P. mimikae* and *P. orientalis*. Among all our *analoga* from N.W. New Guinea, however, we have not found specimens of the smaller form; and also from the Aru Islands we have, apart from *P. aruensis*, received only typical *P. analoga*, and the small specimens from those isles which we have received we consider to be females of *P. analoga*, which are, indeed, hardly distinguishable from the males of *P. gracilis*, though generally a little darker. Dr. van Oort, however, gives Aru also as the habitat of *gracilis*. Formerly we have treated *P. notata* as a subspecies of *P. analoga*, and *P. gracilis* as a distinct species. We think now that this view, which is also so far shared by Mr. Mathews, should be modified; that *P. gracilis* should be treated as a subspecies of *analoga*, and *notata* as another species. The reason for this is that the stout bills, mottled (almost striped) underside and paler upper surface of *P. notata* separate it well from *P. analoga*, while, on the other hand, *P. gracilis* is hardly separable from *analoga* except by size, unless it be by its paler upperside.

We are now acquainted with the following forms of the species *P. analoga* and its allied forms :

1. *Ptilotis analoga analoga*: New Guinea, Islands in the Geelvink Bay, Batanta, Mysol, Waigin (teste Salvadori), Aru Islands (Wokam, Kobroor, Trangan!).

2. *Ptilotis analoga longirostris* Grant (*Ptilotis longirostris* Ogilvie-Grant, *Bull. B.O. Club* xxix. p. 27, November 1911, Wamma, Aru Islands, A. R. Wallace Coll.). Mr. Ogilvie-Grant compared his *P. longirostris* with *P. aruensis*, but it is not an ally of the latter. In fact, it is nothing but a *Ptilotis analoga* with a longer bill; culmen 26 mm. from the forehead, which is only 2 mm. more than in many *P. a. analoga*. As *P. analoga* with bill of the usual length occurs on Wokam, Kobroor, and Trangan, it is not very probable that the little island of Wamma should have a specialised form, but it is, of course, possible. The unusual length of the bill was already noticed on the label by Dr. Wallace, who, however, did not at that time separate *P. aruensis*.

3. *Ptilotis (analoga?) gracilis* Gould: North Queensland.—I have already given my reasons for considering that this must be a representative in North Queensland of *P. analoga*. If it should be true that *P. gracilis* occurs side by side with *analoga* in New Guinea and Aru, it would be treated as another species, but I am inclined to think that what Mr. Ogilvie-Grant and Dr. van Oort call *P. gracilis* in New Guinea are small females of *P. analoga analoga*.

4. *P. (analoga?) vicina* Rothsch. & Hart., *Nov. Zool.* 1912, p. 203, described from the Sudest Islands. This bird has the strong bill of *notata* and *aruensis*, while the coloration of the underside and rump is exactly like that of *P. analoga*; the greyish forehead is quite peculiar.

5. *Ptilotis notata* Gould: North Queensland. See remarks anteà.—Mr. Mathews (*Nov. Zool.* xviii. p. 403) separates further a *P. analoga mixta* and *P. gracilis imitatrix* which I cannot at present discuss; I am therefore awaiting a fuller description and statement about the material on which these forms were based.

6. *P. orientalis* A. B. Meyer: Mountains of British Papua and Snow Mountains. See anteà, No. 198.

7. *P. mimikae* Grant: the same distribution as *P. orientalis*.

8. *P. aruensis aruensis* Sharpe: Aru Islands and Snow Mountains.

9. *P. aruensis sharpei* Rothsch. & Hart.: New Guinea. Cf. *Nov. Zool.* 1903, p. 442.

10. *P. montana*: Dutch and German New Guinea, and Aicora River, in the N.E. corner of British Papua, near the German frontier (Arfak, Kapaur, Sattelberg).—*Ernst Hartert.*]

v 199. **Motacilla boarula melanope** Pall.

[*Motacilla boarula* Linnaeus, *Mantissa Plantarum*, p. 527 (1771—Habitat in Europa. Restricted terra typica: Sweden. Description only referable to this bird, but quotations and biological mixed).]

*Motacilla Melanope* Pallas, *Reise d. versch. Prov. d. Russ. Reichs*, iii, p. 696 (1776—"In Daouria circa ripas glareosas").

5 ♂ ♀; Upper Setekwa River, November 1911. (Nos. 4959, 4960, 4970, 4990, 5000, A. S. Meek Coll.)

√ 200. *Munia tristissima* Wall.

*Munia tristissima* Wallace, *Proc. Zool. Soc. Lond.* 1865. p. 479 (N.W. Peninsula of New Guinea).

7 ♂ ♀; Upper Setekwa River, July and August 1910. (Nos. 4439, 4453, 4463, 4464, 4465, 4466, 4467, A. S. Meek Coll.)

"Iris dark brown; bill and feet slaty blue."

We have also two skins from Dorey, one from the hills near Humboldt Bay, and five from the Kumusi River in the northernmost part of north-eastern British New Guinea.

√ 201. *Gymnocorvus senex* (Less.).

Cf. *Nov. Zool.* 1903. p. 91; van Oort, *Nova Guinea*, ix. i. p. 99.

♂; Snow Mountains, 3000 ft., 3. xi. 1910. (No. 4949, A. S. Meek Coll.)

"Iris light blue; feet chalk white; bill flesh-colour."

√ 202. *Phonygammus keraudrenii keraudrenii* (Less. & Garn.).

*Barita Keraudrenii* Lesson and Garnier, *Ferussac's Bull. Sci. Nat. et Géol.* viii. p. 110 (1826—New Guinea; terra typica Dorey); cf. *Nov. Zool.* 1903. pp. 86, 87; van Oort, *Nova Guinea* ix. Zool. i. p. 104.

♂ ad.; Upper Setekwa River, 30. vii. 1910. (No. 4449, A. S. Meek Coll.)

1 ♀ ad., 2 ♀ jun., 1 ♀ juv.; Snow Mountains, 2000 ft., August—October 1910. (Nos. 4612, 4690, 4811, 4823, A. S. Meek Coll.)

♂ ad.; Eilanden River, 16. xii. 1910. (No. 5075, A. S. Meek Coll.)

♀ juv.; Upper Eilanden River, 4. iii. 1911. (No. 5476, A. S. Meek Coll.)

♂ No. 5075 is slightly smaller than ♂ 4449.

(Mr. Ogilvie-Grant records *P. keraudrenii jamesi* as obtained by the Goodfellow expedition, but our specimens do not belong to that form.)

A character hitherto not mentioned by us is the greater length and width of the hackles on the neck and breast in *P. k. jamesi*.

√ 203. *Manucodia chalybata orientalis* Salvad.

Cf. *Nov. Zool.* 1903. p. 85; van Oort, *Nova Guinea* ix., Zool. i. p. 103.

4 ♂ ad., 1 ♀ ad., 2 ♂, 1 ♀ jun.; Snow Mountains, 2000, 2500, 3000 ft., August—November 1910. (Nos. 4559, 4597, 4856, 4937, 4952, 4953, 4603, 4716, A. S. Meek Coll.)

204. *Manucodia chalybata* ?

♂; Upper Setekwa River, 15. xi. 1910. (No. 5002, A. S. Meek Coll.)

This specimen is not quite adult, and differs from our immature examples of *M. chalybata orientalis* in the absence of the velvety terminal bars to the dorsal feathers, thus giving the appearance of the back of *Manucodia atra*, though of a glossy purple, not greenish blue colour. Whether this is merely an abnormal specimen, or a hybrid, cannot be decided from this single specimen.

[*Manucodia jobiensis* Salvadori was treated as a subspecies by one of us in the *Ibis*, 1911, p. 367, but the Goodfellow expedition obtained both *M. chalybata orientalis* and *jobiensis* at Pariman, therefore we must return to the former view, that *M. chalybata* and *jobiensis* are good species. Cf. Tierreich, *Paradiseidae*, pp. 44, 45, and *Nov. Zool.* 1903, p. 86.]



✓ 205. *Manucodia atra atra* (Less.).

Cf. *Nov. Zool.* 1903. p. 84; van Oort, *Nova Guinea* ix., Zool. i. p. 104.

♂ ♀ ad., ♀ juv.; Upper Setekwa River, 14, 20. vii. 1910. (Nos. 4361, 4396, 4397, A. S. Meek Coll.)

✓ 206. *Paradisea apoda novaeguineae* Alb. & Salvad.

*Paradisea apoda* var. *novaeguineae* d'Albertis and Salvadori, *Ann. Mus. Genova* xiv. p. 96 (1879—Fly River); van Oort, *Nova Guinea* ix., Zool. i. p. 103.

3 ♂ juv., 2 ♀ ad.; Upper Setekwa River, July to November 1910. (Nos. 4288, 4400, 4418, 4525, 4981, A. S. Meek Coll.)

✓ 207. *Cicinnurus regius regius* (L.).

*Paradisea regia* Linnaeus, *Syst. Nat.* ed. x. i. p. 10 (1758—"India orient." 1); cf. van Oort, *Nova Guinea* ix., Zool. i. p. 102.

♂ ♀ juv.; Upper Setekwa River, 15. ix. 1910, 13. xi. 1910. (Nos. 4543, 4988, A. S. Meek Coll.)

♂ juv.; Snow Mountains, 2000 ft., 11. x. 1910. (No. 4813, A. S. Meek Coll.)

✓ 208. *Diphyllodes magnificus magnificus* (Penn.).

*Paradisea magnifica* Pennant, in Forster's *Zool. Ind.* p. 40 (1781—No definite locality); cf. van Oort, *Nova Guinea* ix. i. p. 102.

2 ♂ ad., 1 ♂ juv., 3 ♀; Snow Mountains, 2000—3000 ft., July—October 1910. (Nos. 4552, 4604, 4642, 4712, 4716, 4919, A. S. Meek Coll.)

The two adult males have the inner secondaries exactly alike and of a dull orange. They agree thus fairly well with the brighter specimens of our series of what we call typical *magnificus*. Males obtained by the Goodfellow expedition are called *chrysoptera* by Mr. O.-Grant (t.c. p. 271). Typical *chrysoptera* from Jobi are, however, much brighter and darker orange on the inner secondaries; in fact, except for having fuscous instead of rufous brown crowns, they are quite comparable with *hunsteini*.

Lesson's name "*seleucides*" appears on p. 16 of his "*Paradiseidae*," and on the same page, under the genus *Diphyllodes*, he distinctly states that his genus contains only a single species. On p. 191 Lesson calls the birds figured on plates 19 and 20 *D. magnificus*, while the same plates were quoted on p. 16 as *D. seleucides*. It is therefore quite clear that the name *seleucides* was only a new name for *magnificus*; and it is thus impossible to use the names *magnificus* and *seleucides* for two different forms. Should it become necessary, when more material with exact localities and dates comes to hand, to separate the birds with dull orange inner secondaries from those with clay-coloured ones, the latter will have to receive a new name.

✓ 209. *Astrapia splendidissima* Rothsch.

*Astrapia splendidissima* Rothschild, *Nov. Zool.* ii. p. 59, pl. 5 (1895).

The adult males differ from our trade-skins from Dutch New Guinea in the following points:

The green of the head and neck above lacks the golden gloss and is more bluish. The throat and lower neck are more bluish and less golden; the metallic

red jugular band and line on each side of the throat are much more coppery, less crimson, the green of the breast and abdomen is much less yellowish. These differences, however, are not likely to be of any taxonomic value, as the colour of metallic parts varies much according to treatment—carbolic acid, for example, altering them completely, also the process of roasting the skins over fire, which is apparently resorted to by many Papuans.

2 ♂ ad., 4 ♂ juv., 6 ♀; Mount Goliath, not less than 5000 ft., January and February 1911. (Nos. 5127, 5128, 5139, 5150, 5268, 5269, 5271, 5318, 5389, 5431, 5463, A. S. Meek Coll., one without label.)

“ Iris black ; bill black ; feet slaty-blue.”

√ 210. **Falcinellus striatus atratus** Rothsch. & Hart.

*Falcinellus striatus atratus* Rothschild and Hartert, *Nov. Zool.* 1911, p. 160 (Mt. Goliath, A. S. Meek Coll., type in Tring Museum).

1 ♂ ad., 2 ♂ juv., 3 ♀ ad., 1 ♀ pull.; Mt. Goliath, January and February 1911. (Nos. 5100, 5126, 5306, 5369, 5370, 5413, 5401, A. S. Meek Coll.)

A second adult male has been presented by Mr. A. S. Meek to the Governor-General of the Dutch East Indies.

√ 211. **Seleucidus ignotus ignotus** (Forst.).

*Paradisea ignota* Forster, *Ind. Zool.* pp. 31, 36 (1781—New Guinea); van Oort, *Nova Guinea* ix. Zool. i. p. 101.

♂ juv.; Upper Setekwa River, 21. vii. 1910. (No. 4403, A. S. Meek Coll.)

♂ ad. in moult, ♂ juv.; Eilanden River, 15, 21. xii. 1910. (Nos. 5072, 5084, A. S. Meek Coll.)

√ 212. **Ptiloris magnificus** (Vieill.).

*Falcinellus magnificus* Vieillot, *Nouv. Dict. d'Hist. Nat.* xxviii. p. 167. pl. g.39. fig. 3 (1819).

♂ ♀ ad.; Upper Setekwa River, 29. vii., 2. viii. 1910. (Nos. 4448, 4468, A. S. Meek Coll.)

♂ juv., 3 ♀ ad.; Snow Mountains, 2000–3000 ft., September to November 1910. (Nos. 4695, 4719, 4823, 4950, A. S. Meek Coll.)

♂ ad., ♂ juv.; Upper Eilanden River, 3. iii. 1911. (Nos. 5471, 5472, A. S. Meek Coll.)

/ 213. **Pteridophora alberti** A. B. Meyer.

*Pteridophora alberti* A. B. Meyer, *Bull. B.O. Club* iv. p. 11 (1894—“East of Ambernoh River,” according to Mr. Duivenbode); van Oort, *Notes Leyden Museum* xxx. p. 241.

♂ in full moult, with blue appendages only an inch long; Mt. Goliath, 6. ii. 1911. (No. 5319, A. S. Meek Coll.)

“ Iris brown ; bill black ; feet dark brown.”

√ 214. **Lophorina superba minor** Rams. (?).

*Lophorina superba minor* Ramsay, *Proc. Linn. Soc. N. S. Wales* x. p. 245 (1885—Owen Stanley Mountains, Haustein leg.).

♀ juv.; Snow Mountains, 3000 ft., 19. x. 1910. (No. 4858, A. S. Meek Coll.)

“ Iris pale steel-blue ; bill black ; feet vandyke brown.”

This is the youngest *Lophorina* we have seen ; the head is not black, but

brown, and both crown and neck are spotted with pale yellow; the underside is brownish buff, not greyish white. The back is still less brown, a little more olive-grey than in our youngest *L. s. minor*. It would, therefore, be most desirable to examine adult males and females from this region, as there might exist small differences from typical *minor*.

√ 215. *Parotia carolae carolae* A. B. Meyer (?).

*Parotia carolae* A. B. Meyer, *Bull. B. O. Club* iv. p. 6 (1894—"N.W. New Guinea," but described from trade-skins without locality); van Oort, *Nova Guinea* ix., *Zool.* i. p. 102.

2 ♀; Mt. Goliath, 6, 7. ii. 1911. (Nos. 5317, 5326, A. S. Meek Coll.)

"Iris silvery and ashy grey; bill black; feet black and dark brown."

Until we have seen males from Mt. Goliath, we shall not be certain whether these birds belong to *P. c. carolae* or *berlepschi*, but they are certainly more grey, less olive, than our females of *meekei*.

√ 216. *Parotia carolae meeki* Rothsch.

*Parotia carolae meeki* Rothschild, *Bull. B. O. Club* xxvii. p. 35 (1910—Snow Mountains).

1 ♂ ad., 3 ♀ ad., 3 ♂ imm.; Snow Mountains, 3000 ft., August to November, 1910. (Nos. 4558, 4610, 4846, 4896, 4913, 4914, 4951, A. S. Meek Coll.)

The iris of the adult male is described as "lemon yellow."

The old male after all differs from that of *P. c. carolae* only in having a black chin, upper throat and cheeks.

√ 217. *Paradigalla brevicauda* Rothsch. & Hart.

*Paradigalla brevicauda* Rothschild and Hartert, *Nov. Zool.* 1911. p. 159 (Mt. Goliath, collected by A. S. Meek. Type in Tring Museum); Rothschild, *Ibis* 1912. p. 109. pl. ii.

7 ♂ ad., 3 ♂ jun., 5 ♂ juv., 4 ♀ ad.; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5099, 5120, 5123, 5124, 5145, 5164, 5183, 5191, 5220, 5123, 5247, 5250, 5322, 5323, 5340, 5357, 5428, 5462, 5467, A. S. Meek Coll.)

√ 218. *Loboparadisea sericea* Rothsch.

*Loboparadisea sericea* Rothschild, *Bull. B. O. Club* vi. p. 15 (1896—"North coast of New Guinea"—from hearsay, exact locality not known. Figured *Nov. Zool.* 1897. pl. 2).

3 ♀; Mount Goliath, 29. i., 4, 13. ii. 1911. (Nos. 5235, 5299, 5375, A. S. Meek Coll.)

"Iris dark brown; bill and feet black."

We have no doubt that these must be females of a *Loboparadisea* very closely allied to *L. sericea*, and probably of the latter, but until males from Mt. Goliath are examined, we cannot be absolutely certain. There is no turned-up wattle as in the male, but between the nostrils and the lores is an area of soft skin, and a narrow line of feathers runs up from each nostril to the forehead. The colour from the forehead to beyond the middle of the back is brownish olive (instead of yellowish chestnut), lower back and rump lemon-yellow with olive markings on the middle of some feathers; upper tail-coverts rufous-olive. Tail deep rufous-brown (instead of bright rufous). Under-surface lemon instead of golden yellow. Wings 96-99 mm., while the wings of the four males now in the Tring Museum measure from 90 to 98 mm.

219. *Loria loriae* Salvad.

*Loria loriae* Salvadori, *Ann. Mus. Genova*, ser. 2 ; vol. xiv. p. 151 (1884—Moroka district, Owen Stanley Mountains).

8 ♂ ad., 2 ♂ jun., 4 ♂ juv., 8 ♀ ad., 2 ♀ jun. ; Mt. Goliath, not less than 5000 ft., January and February 1911. (Nos. 5090, 5114, 5125, 5149, 5234, 5256, 5272, 5283, 5291, 5305, 5316, 5327, 5328, 5335, 5336, 5337, 5359, 5372, 5401, 5402, 5430, 5456, 5457, 5467, A. S. Meek Coll.)

♂ ad. : " Iris dark brown ; bill and feet black." (Females similar.)

√ [220. *Xanthomelus aureus ardens* D'Alb. & Salvad.

*Xanthomelus ardens* D'Albertis and Salvadori, *Ann. Mus. Civ. Genova* xiv. p. 113 (1879—Fly River) ; van Oort, *Nova Guinea* ix., Zool. i. p. 100, pl. iii. (1909—Sabang).

Meek failed to secure this bird either on the Oetakwa, Setekwa, or Eilanden Rivers. Up to the year 1907—so for twenty-eight years—this very fine form was only known from the mutilated type, a native skin wanting the whole under-surface throat and cheeks, and the perfect young male killed by D'Albertis. In 1907 Dr. H. A. Lorentz, when exploring the Noord River in S.W. Dutch New Guinea, was able to collect two adult males, which at once showed by their red (not black) cheeks and the absence of the black on the throat that the form was much more distinct from *X. aureus aureus* than we had hitherto thought. In 1910–11 the B. O. U. Expedition under Mr. Goodfellow procured seven specimens on the Waitakwa River, an affluent—like the Setekwa—of the Oetakwa River. Of these three were adult males, one an adult female, and three immature males.

The adult male, which on the upperside agrees with the type, has the secondaries more narrowly (half-inch) tipped with black and a single black spot at the end of the longest tertial ; the second male has the two longest tertials three-parts black and the secondaries **broadly** tipped with black ; but the third male, while having the secondaries and tertials as in No. 1, has black lores and a black patch on each side of the throat, and the bill also is larger and blacker.

The male of *X. a. ardens* differs from *aureus aureus* by the more slender and not blackish bill by the head and mantle being fiery red instead of orange, and by having all the secondaries broadly tipped with black, instead of a narrow black terminal line on the outer three, or narrow black tips only to the outer four or five ; the throat is yellow and the lores and cheeks fiery red instead of deep black. The females and young males differ in being much more olivaceous grey-brown, not deep umber-brown on the upperside ; the throat is white cinnamon-buff and the cheeks and sides of neck greyish earth-brown, instead of pale and dark umber-brown ; on the upper breast the transverse lunulated bands are much less pronounced or entirely absent instead of being strongly marked.

The black lores and throat-patches in the third adult male of Mr. Goodfellow show that I was quite right in placing *X. ardens* as a subspecies of *X. aureus aureus*. I feel that the followers of the more modern systems of nomenclature must make a stand against the tendency of certain authors to continue to treat as species all the forms of fine brilliant families like the *Paradisoidae* and only to treat allied forms of inconspicuous families as subspecies. The genus *Xanthomelus* has not yet been found in German New Guinea nor in the North Coast Region. The figure of the adult male of *X. a. ardens* in Sharpe's *Monograph of the Paradisoidae* is entirely fictitious as regards the underside.—*Walter Rothschild.*]

✓ 221. *Amblyornis inornatus musgravii* Goodwin.

[*Ptilonorhynchus inornatus* Schlegel, *Nederl. Tijdschr. Dierk.* iv. p. 51 (1873—Arfak).]

*Amblyornis musgravii* Goodwin, *Proc. Zool. Soc.* 1889. p. 451 (Mt. Musgrave; attempt to diagnose).

*Amblyornis musgravianus* Goodwin, *Ibis*, 1890. p. 153 (Mount Musgrave).

*Amblyornis macgregoriae* de Vis, *Report on British New Guinea* 1888-89, App. C. pp. 113, 115 (1890—Mount Musgrave).

♀ ad.; Snow Mountains, 23. x. 1910. (No. 4876, A. S. Meek Coll.)

3 ♂, 6 ♀ ad.; Mt. Goliath, January and February 1911. (Nos. 5096, 5113, 5259, 5260, 5331, 5373, 5379, 5468, 5469, A. S. Meek Coll.)

♂ ad: "Iris dark brown; bill black above, horn-colour beneath; feet dark slate."

When one of us wrote the *Paradiseidae*, in No. 2 of the *Tierreich*, he united the form from British New Guinea with the typical *A. inornatus* from Arfak, the adult male of which was unknown till 1894. He did this on the comparison of the orange crests as, at the time, the small number of specimens available made the more rufous shade of the Arfak birds appear a doubtful character. As we now have ten adult males and eight males without crests and females from the Arfak region, and fifteen adult males and fourteen females or males without crests from British New Guinea, the Snow Mountains and Mt. Goliath for comparison, it is clear that the Arfak birds have a decidedly more rufous tinge above and below, while those from the other localities are more olive above and duller below. Therefore we are of the opinion that these forms should be separated as subspecies.

In October 1910 *Amblyornis subalaris germanus* from the Rawlinson Mountains was described (*Bull. B. O. Club*, xxvii. p. 13). The chief reason for treating it as a subspecies of *A. subalaris* was the small size and an imperfect and distorted crest of a male. Later on we received a full-plumaged male, which distinctly proves that *germanus* is a form of *A. inornata* and not of *subalaris*, being distinguished from *A. inornata musgravii* by its still more accentuated olive shade as well as its small size.

Thus the genus *Amblyornis* consists now of the following forms:

1. *Amblyornis subalaris* Sharpe: British New Guinea.
2. " *flavifrons* Rothsch.: Dutch New Guinea.
3. " *inornatus inornatus* (Schleg.): Arfak Peninsula.
4. " *inornatus musgravii* Goodwin: Central Dutch and British New Guinea, as far north as Mt. Batchelor on the British frontier of German New Guinea (♂ ad. in the Munich Museum examined, for the loan of which we are obliged to Mr. Hellmayr).
5. *Amblyornis inornatus germanus* Rothsch.: Rawlinson Mountains, Huon Gulf, German New Guinea.

✓ 222. *Ailuroedus melanotis melanocephalus* Rams.

*Ailuroedus melanocephalus* Ramsay, *Proc. Linn. Soc. N.S. Wales*, viii. p. 25 (1883—Owen Stanley Range).

2 ♂, 4 ♀; Snow Mountains, 2000 to 3000 ft., August to November 1910. (Nos. 4577, 4601, 4650, 4727, 4854, 4948, A. S. Meek Coll.)

"Iris red; feet and bill pale slaty-blue."

✓ 223. *Ailuroedus buccoides buccoides* (Temm.).

*Kitta buccoides* Temminck, *Pl. Col.* 575 (1835—Lobo Bay).

*Ailuroedus buccoides* v. Oort, *Nova Guinea* ix., *Zool.* i. p. 99 (1909—Noord River, Sabang, Alkmaar).

♂ ; Upper Setekwa River, 4. vii. 1910 (No. 4272, A. S. Meek Coll.)

2 ♂ ; Snow Mountains, 2000 ft., 3. ix. 1910, 9. x. 1910. (Nos. 4705, 4807, A. S. Meek Coll.)

♀ ; Upper Eilanden River, 3. iii. 1911. (No. 5470, A. S. Meek Coll.)

“ Iris red ; bill and feet pale blue.”

It has remained for Dr. van Oort, with the aid of Temminck's type and the specimens collected by Dr. H. A. Lorentz, to discover that the “Cat-Birds” hitherto identified as the “*Kitta buccoides*” of Temminck are not that form. The true *Ai. buccoides buccoides* is evidently confined to the coasts and hinterland of Southern Dutch New Guinea ; it differs from the birds of North-west New Guinea and adjacent islands by its much smaller beak, deeper brownish buff underside, and somewhat smaller black spots, though the latter are not nearly so small as in *Ai. buccoides stonii*, and extend over the sides of abdomen and flanks ; the crown of the head is apparently never so deep brown as in adult *stonii*.

The result of this discovery of Dr. van Oort's, which is strikingly confirmed by our specimens, is, that *Ai. buccoides auctorum* from N.W. Guinea and adjacent islands is without a name. We propose to call it

***Ailuroedus buccoides oorti***

after Dr. van Oort of Leiden.

Type: “ ♀ ” ; Waigiu, 24. xii. 1902, John Waterstradt Coll., in the Tring Museum.

In *Pygmies and Papuans*, p. 273, Mr. Ogilvie-Grant named specimens collected by the Goodfellow expedition “*Ailuroedus stonoi*” ; this was evidently caused by the dark underside of the specimens as compared with our *Ai. b. oorti*.

✓ 224. *Oriolus striatus* Quoy & Gaim.

*Oriolus striatus* Quoy et Gaimard, *Voy. Astrolabe* i. p. 191, pl. ix. fig. 2 (1830—Dorey, New Guinea) ; cf. *Nor. Zool.* 1903. p. 111.

3 ♂ ; Upper Setekwa River, August, September, November 1910. (Nos. 4977, 4546, 4481, A. S. Meek Coll.)

♂ ; Upper Eilanden River, 4. iii. 1911. (No. 5478, A. S. Meek Coll.)

✓ 225. *Melanopyrrhus anais orientalis* (Schleg.).

*Nor. Zool.* 1903. p. 113 ; v. Oort, *Nova Guinea* ix. *Zool.* livr. i. p. 106.

1 ♂, 3 ♀ ad., 1 ♀ juv. ; Setekwa River, June and November 1910. (Nos. 4203, 4204, 4205, 4214, 4995, A. S. Meek Coll.)

1 ♂ ad. ; Upper Setekwa River, 14. xi. 1910. (No. 4994, A. S. Meek Coll.)

All the adult specimens have entirely orange-yellow crowns, while out of the seventeen specimens mentioned in *Nor. Zool.* 1903. p. 113, only four have the crown entirely orange-yellow, and these are all from Southern British New Guinea. Although we have three specimens from British New Guinea with more or less black on the occiput, should it be proved that the birds found north of the central

mountain ranges always have black on the occiput, that form would have to be called *M. anais robertsoni* d'Alb. (*Sydney Mail* 1877. p. 247—*teste* Salvadori, *Orn. Pap.* ii. p. 463 !)

√ 226. **Mino dumontii** Less.

Cf. *Nov. Zool.* 1903. p. 113.

♀; Snow Mountains, 2000 ft., 30. ix. 1910. (No. 4757, A. S. Meek Coll.)

5 ♂ ♀; Lower and Upper Setekwa River, June and November 1910. (Nos. 4231, 4986, 4996, 5008, 5029, A. S. Meek Coll.)

Comparing these specimens with a series from North-Western New Guinea (terra typica Dorey, Arfak), they are found to agree fairly well with the latter; their wings range from 140 to 150 mm., the females being smaller than the males; also Aru specimens agree fairly well with them, though their beaks are sometimes very small. There are, however, a number of specimens from Northern German New Guinea (Friedrich-Wilhelm-Hafen) in the Tring Museum, which have enormous bills, and wings from 150 to 160 mm. We would separate these, were it not for one skin, which is quite small. We therefore prefer to await the examination of a bigger series of well-sexed specimens, before creating a new name, though we are certain that this will have to be done before long.

√ 227. **Lamprocorax metallicus metallicus** (Temm.).  
(*Calornis metallicus metallicus* auct.)

Cf. *Nov. Zool.* 1903. p. 114; 1912. p. 311.

5 ♂ ♀ ad., 1 ♂ juv.; Lower Setekwa River, June and November 1910. (Nos. 4183, 4185, 5012, 5018, 5019, 5020, A. S. Meek Coll.)

√ 228. **Dicrurus bracteatus assimilis** Gray.

Cf. *Nov. Zool.* 1903. pp. 109. 110; van Oort, *Nova Guinea* ix. *Zool.* i. p. 105.

6 ♂ ♀; Upper Setekwa River, July 1910. (Nos. 4274, 4311, 4319, 4324, 4342, 4352, A. S. Meek Coll.)

These specimens, like those recorded by Dr. van Oort from the Noord River, Sabang, and other places, agree well with the Aru birds. Their wings measure 140 (♀) to 150 (♂) mm.

√ 229. **Chaetorhynchus papuensis** Mey.

Cf. *Nov. Zool.* 1903. p. 110.

5 ♂, 1 ♀; Snow Mountains, 2000 to 3000 ft., July, August, October 1910. (Nos. 4554, 4561, 4568, 4571, 4572, 4865, A. S. Meek Coll.)

These specimens are quite typical, except that they possibly average smaller than the Arfak race (terra typica Arfak!), but our Arfak material is too poor to come to a conclusion about this fact. The wings of the Snow Mountains examples measure 117–120.5 (males) and 109 (female) mm.

The specimens from British New Guinea are equally small, and—if separable—would belong to the same race.

## SIPHONAPTERA COLLECTED BY MR. ROBIN KEMP IN TROPICAL AFRICA.

BY DR. K. JORDAN AND THE HON. N. CHARLES ROTHSCHILD, M.A.

MR. ROBIN KEMP collected mammals during the years 1910-11 in British East Africa, Uganda, and the adjoining district of the Belgian Congo, and sent us a large collection of parasites which he had secured from some of his mammal captures. No real collection of the Ectoparasites of this district had previously been made, so it is not surprising that the present collection contains many interesting forms and new species.

Mr. Kemp secured thirty-nine species of *Siphonaptera* in all, of which twenty-one are new. Several of these new species have been found on mammals with fossorial habits, and their study has greatly assisted to correct the classification of certain groups of fleas.

In the present paper we have separated some genera from *Ctenophthalmus* and *Leptopsylla*, as a result of the investigation of certain of the species received from Mr. Kemp.

Mr. Kemp's collection comprises two new species of the genus *Ctenocephalus* allied to the common dog-flea. These two—together with *wollastoni* and *rosmarus*, also species from the Ethiopian region—are all the known members of the genus *Ctenocephalus* (apart from *canis* and *felis*), and indicate that Africa is the real home of this genus of fleas. Apart from the common *Ct. canis* and *felis*, no member of this genus is known from any country other than Africa.

In the case of two of the genera we have enumerated all the species known from the Ethiopian region.

### 1. *Echidnophaga larina* Jord. & Roths. (1906).

*Echidnophaga larina* Jordan and Rothschild, in Thomps. Yates and Johnst. *Labor. Rept.* vii. 1. p. 49. no. 3. t. 1. fig. 12, t. 2. fig. 18, t. 3. fig. 25 (1906) (Cape Colony, Somaliland, Abyssinia).

1 ♀ from Eusso Nyiro, British East Africa, January 31, 1911.

4 ♀♀ from Masaka, Uganda, April 2, 1911, off a domestic dog.

### 2. *Echidnophaga gallinaceus* Westw. (1875).

*Sarcopsyllus gallinaceus*, Westwood, *Ent. Mo. Mag.* xi. p. 246 (1875) (Ceylon).

*Echidnophaga gallinaceus*, Jord. & Roths., *l.c.*, p. 52, no. 5. t. 1. fig. 1, t. 2. fig. 14, t. 3. fig. 21, t. 4. fig. 27 (1906) (tropical and subtropical districts of Asia and Africa, and Southern U.S.A.).

3 ♀♀ from Taveta, Kilimanjaro, May 12, 1910, off *Mus rattus*.

1 ♂ from Nakuru, British East Africa, September 23, 1910, off *Herpestes* spec.

### 3. *Echidnophaga aethiops* Jord. & Roths. (1906).

*Echidnophaga aethiops* Jordan and Rothschild, *l.c.* p. 51. no. 4 (1906) (Namaqualand).

1 ♀ from Voi, British East Africa, April 13, 1910, off a bat.

The second segment of the maxillary pulpus is not quite so short in this specimen as in the type, but is nevertheless shorter than in *E. gallinaceus*. The hindcoxa, moreover, bears a larger number of spiniform bristles than the type-specimen. *E. aethiops* appears to be close to *E. marina* Tirab. (1903), which occurs on rats in Italy.



4. *Pulex irritans* L. (1758).

*Pulex irritans* Linué, *Syst. Nat.* ed. x. p. 614. no. 1 (1758) (partim); Jord. & Roths., *l.c.* p. 7. no. 1 (1906).

1 ♀ from the Aberdare Mts., British East Africa; no host given.

1 ♀ from Gazi, British East Africa, August 12, 1910; caught in grass.

5. *Xenopsylla somalicus* Jord. & Roths. (1908).

*Loemopsylla somalicus* Jordan and Rothschild, *Parasitology* i. p. 37. no. 2. t. 3. fig. 8 (1908) (South Somaliland).

The hindtibia bears usually one, occasionally two bristles on the outer surface, but never a series, as in *X. pallidus* Tasch. (1880).

1 ♂ and 1 ♀ from Voi, British East Africa, May 14, 1910.

1 ♂ and 4 ♀♀ from Eusso Nyiro, British East Africa, January 28 and 29, 1911.

17 ♂♂ and 21 ♀♀ from Nyama Nyango, Eusso Nyiro, January 30, 1911.

4 ♂♂ and 6 ♀♀ from Eusso Nyiro, February 3, 1911.

Host: *Xerus dabagala rufifrons*, a squirrel.

6. *Xenopsylla cheopis* Roths. (1904).

*Pulex cheopis* Rothschild, *Ent. Mo. Mag.* (2). xiv. p. 85. no. 4. t. 1. fig. 3, 9, t. 2. fig. 12, 19 (1903) (Shendi).

*Loemopsylla cheopis*, Jordan and Rothschild, *Parasitology* i. p. 4. no. 6. t. 1, t. 2. fig. 8, t. 4. fig. 8, t. 6. fig. 1 (1908).

1 ♀ from Taveta, Kilimanjaro, May 10, 1910, off *Paraxerus aruscensis*.

1 ♂ and 20 ♀♀ from Nakura, British East Africa, September 22 and 24, 1910, off *Tachyoryctes* spec.

2 ♂♂ from Entebbe, Uganda, March 20, 1911, off the common brown rat.

2 ♂♂ and 1 ♀ from Rumruti, British East Africa, September 27, 1910, off *Arvicanthus massaicus*.

1 ♂ from Easso Nyiro, British East Africa, January 24, 1911, off *Thamnomys* spec.

7. *Xenopsylla nubicus* Roths. (1903).

*Pulex nubicus* Rothschild, *Ent. Mo. Mag.* (2). xiv. p. 84. no. 2, t. 2. fig. 10. 16 (1903) (Shendi).

*Loemopsylla nubicus*, Jordan and Rothschild, *l.c.* p. 46. no. 8. t. 3. fig. 6, t. 4. fig. 6 (1908).

*Xenopsylla nubicus*, iid., *Nov. Zool.* xviii. p. 64. no. 5. text-fig. 1 (1911).

1 ♀ from Voi, British East Africa, April 16, 1910, off *Tatera osgoodi*.

1 ♂ from Taveta, Kilimanjaro, May 26, 1910, off desert-rat.

8. *Xenopsylla brasiliensis* Baker (1904).

*Pulex brasiliensis* Baker, *Proc. U.S. Nat. Mus.* xxvii. p. 379 (1904) (São Paulo).

*Loemopsylla vigetus* Rothschild, *Nov. Zool.* xvi. p. 53. no. 1, t. 8. fig. 3. 4. (1909) (Niger).

*Xenopsylla brasiliensis*, Jordan & Rothschild, *l.c.* xviii. p. 65. no. 6. text-fig. 4 (1911).

1 ♂ from Voi, British East Africa, April 12 and 16, 1910, off *Tatera osgoodi*.

1 ♂ and 4 ♀♀ from Taveta, Kilimanjaro, May 12 and 24, 1910, off rats.

1 ♀ from Shimbo Hills, British East Africa, July 21, 1910, off *Arvicanthus dorsalis phocotis*.

1 ♂ and 1 ♀ from Gazi, British East Africa, August 20, 1910, off *Paraxerus aruscensis*.

1 ♂ from Nalasanji, Uganda, July 6, 1911, off *Oenomys* spec.

1 ♂ and 1 ♀ from Kigezi, Uganda, April 12, 1911, off *Arvicanthis abyssinicus rubescens*.

1 ♀ from Naivasha, British East Africa, September 17, 1911, off the same host.

9. *Xenopsylla niloticus* Jord. & Roths. (1908) (text-figs. 1 and 2).

*Loemopsylla niloticus* Jordan and Rothschild, *Parasitology* i. p. 50. no. 12. t. 5. fig. 3 (1908) (Upper Egypt and Sudan).

The present series of specimens has drawn our attention to a rather striking distinction of this species which we did not mention in our original description. The eye of *X. niloticus* (text-fig. 1) is much smaller than in the allied species, even being vestigial on one side of the head in one of the specimens obtained by Mr. Kemp.

The genitalia of the ♂♂ appear to vary to some extent. The "finger" is so much longer in one of the specimens than in the others that we thought at the first the individual belonged to a distinct species. But as the specimen, in other respects, has all the characteristics of *X. niloticus*, we are inclined to

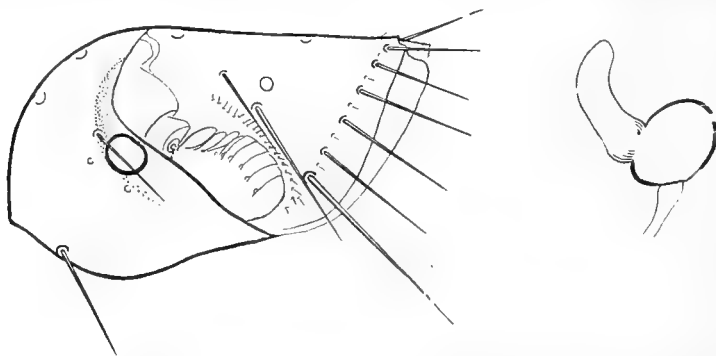


FIG. 1.—Head of *Xenopsylla niloticus* ♂.

FIG. 2.—Receptaculum seminis of *X. niloticus*.

consider it as an abnormal individual. The ninth abdominal sternite of the ♂ also varies, being broader at the apex in some examples than in others.

The receptaculum seminis has a very characteristic shape (text-fig. 2, taken, like fig. 1, from a Sudanese specimen).

A series of both sexes from :

Voi, British East Africa, April 10 and 18, 1910, off *Tatera mombasae* and *Tatera nigricauda*.

Kilimanjaro, May 12 to 16, 1910, off *Tatera nigricauda*.

Mt. Kenia, December 6, 1910, off *Oenomys bacchante*.

Nyama Nyango, Eusso Nyiro, February 3, 1911, off *Tatera nigricauda nyama*.

10. *Xenopsylla isidis* Roths. (1903).

*Pulex isidis* Rothschild, *Nov. Zool.* x. p. 313. no. 2. t. 5. fig. 2. 5. 6 8 (1903) (Harar).

*Loemopsylla isidis*, Jordan & Rothschild, *Parasitology* i. p. 56. no. 16. t. 2. fig. 16, t. 4. fig. 11, t. 6. fig. 3 (1908).

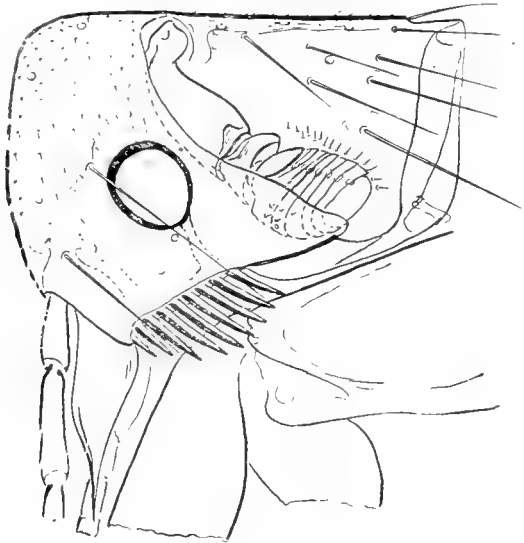
*Xenopsylla isidis*, iid., *Nov. Zool.* xviii. p. 65. no. 7 (1911).

4 ♂♂ and 4 ♀♀ from Mt. Elgon, British East Africa, off *Procapra daemon*.

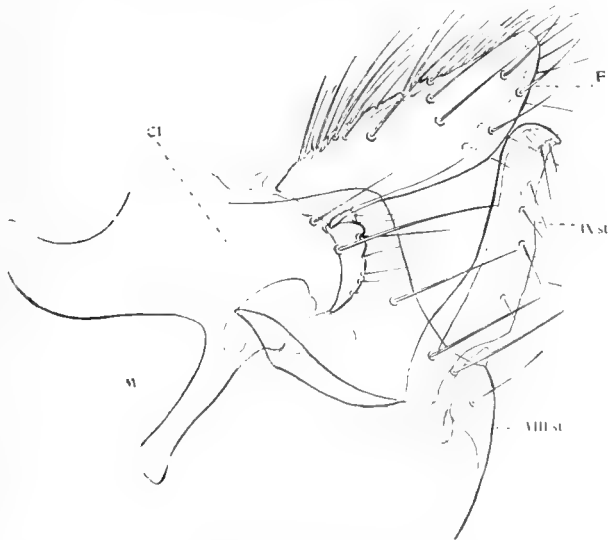
This is a new locality for the species.

11. *Ctenocephalus conversus* spec. nov. (text-figs. 3, 4, and 5).

♂♀. Mr. Kemp obtained both sexes of a species very closely allied to *Ct. wollastoni* Roths. (1908), described from two ♂♂ collected by Dr. A. F. R.

FIG. 3.—*Ct. conversus* ♂.

Wollaston on the Ruwenzori Mts. The new species differs from *wollastoni* in the genal comb only containing seven to nine spines instead of ten or eleven, and in the shape and armature of the modified abdominal segments.

FIG. 4.—*Ctenocephalus conversus*.

♂. The eighth sternite is less evenly rounded at the apex than in *Ct. wollastoni*, and bears a subapical row of four long and two shorter bristles (on each side)

besides two or three small ventral bristles (text-fig. 4). The large movable flap of the clasper (F) is three times as long as it is broad at the widest point (45 : 14), being longer and a little narrower than in *wollastoni*. The long bristles situated on this flap are slightly less numerous than in *wollastoni*, and the small bristles, of which there are ten to twelve in the middle area near the dorsal margin on the inner surface of the flap in *wollastoni*, are replaced in the new species by two to four slender bristles. The ninth sternite, which is rounded at the apex of the ventral arm in *wollastoni*, has this apex rounded dorsally, but angulate ventrally in the new species (IX. st.). Moreover, the bristles on this segment are much less numerous than in *wollastoni*.

♀. The dilated ventral portion of the eighth tergite (text-fig. 5, VIII. t.) is divided by a round apical sinus into a pointed upper lobe and a broader and rounded lower one. The upper portion of this ventral lobe is internally incrassate, and bears at the apical margin five thin bristles, of which two are short, and near the margin on the outer surface a transverse row of four long ones. The

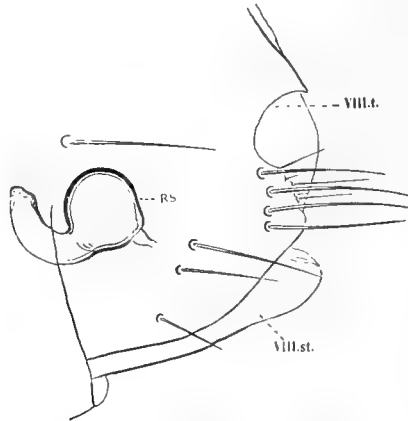


FIG. 5.—*Ctenocephalus conversus*.

segment has, in addition, three bristles more proximal and more ventral in position, and one long one further up the side. The eighth sternite, which is small and elongate, does not bear any bristles. The stylet is very slender, conical, being four times as long as it is broad at the base. The receptaculum seminis (R.S.) has a globular head, which is shorter than the tail.

Length (mounted specimens): ♂ 2.6 mm, ♀ 3.3 mm.

1 ♂ (type) from Mutaragwa, Aberdare Mts., British East Africa, March 15, 1910, off *Lophuromys testudo*.

1 ♀ from Mutaragwa, March 17, 1910, off *Dendrohyrax cravshayi*.

1 ♂ from Mutaragwa, March 23, 1910, off *Genetta stuhlmanni*.

## 12. *Ctenocephalus craterus* spec. nov. (text-figs. 6, 7, and 8).

♂♀. A most interesting species, which connects the preceding one with *Ct. canis* and *felis*. In the high head, the position of the eye, the length of the maxillary and labial palpi, and the size of the antennae, *Ct. craterus* resembles *Ct. wollastoni* and *conversus*, but it agrees with *Ct. canis* and *felis* in the position

and greater length of the genal spines, the presence of a spine at the apex of the genal process, and the structure of the modified abdominal segments.

*Head.*—The frons is not quite so abruptly rounded as in *Ct. wollastoni* and *conversus*, but much the greater part of the anterior margin is nevertheless vertical ( $\delta$ , text-fig. 6) or subvertical ( $\text{♀}$ ). An internal incassation extends from the oral frontal corner obliquely upward as in *Ct. felis* and *canis*, being, however, much shorter in the  $\delta$  of *craterus* than in those species. The eye is well removed from the genal comb, being placed at two-fifths of the distance from the comb to the vertex. There are two long bristles on the frons, one before the eye and the other near the oral frontal corner. The comb commences at this corner as in *canis* and *felis*, and consists of seven (rarely six) long and sharply pointed spines. The occiput bears one long bristle behind the base of the antennal groove, a long and a short one in the middle, and a row of four (on each side) near the apex. The  $\text{♀}$  has no

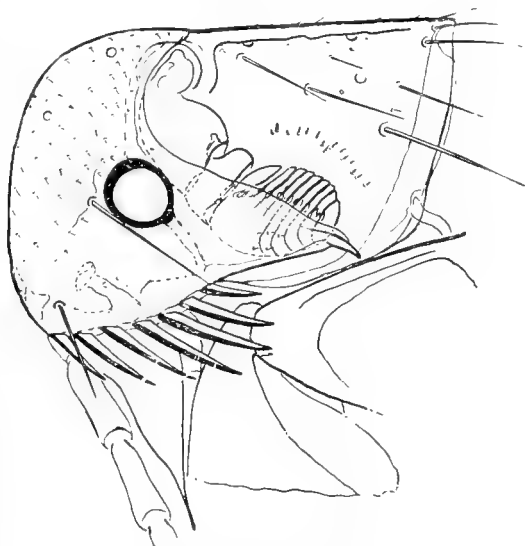


FIG. 6.—*Ctenocephalus craterus*  $\delta$ .

small bristles above the antennal groove, while the  $\delta$  has here a row of about fifteen. The rostrum reaches to the apical fourth of the forecoxa, the first segment of the labial palpi being at least half as long again as segments 2 and 3 together.

*Thorax.*—The pronotum has a comb of sixteen to eighteen pointed spines, the dorsal spines being slightly depressed. There is one row of bristles, containing twelve on the two sides together, on all three thoracic nota. The mesonotum, in addition, bears many small bristles at the base, arranged in one row laterally and in several irregular rows dorsally, these bristles occurring dorsally in both sexes from the base to near the row of long bristles. The mesopleura have six or seven bristles, of which the one placed above the stigma is very long. The metepisternum has one or two bristles (usually two) and the metepimerum twelve to sixteen in two rows (6, 6—or 7, 6—or 8, 7—or 8, 8).

*Abdomen.*—In the  $\text{♀}$  the stigmata are as large as in the  $\delta$  of *canis*, being slightly smaller in the  $\delta$ . The tergites of  $\delta$  and  $\text{♀}$  bear one row of bristles con-

taining (on the two sides together) on the anterior segments ten to twelve and on the posterior ones eight to ten bristles, the first tergite, however, having two rows of four bristles. The antepygial bristle is a very little shorter than the second hindtarsal segment. The sternites have few bristles in both sexes, the numbers being two to four in the ♂ and three or four (rarely five) in the ♀, segment VII. of the ♀ usually having one or two more bristles than the preceding segments.

*Legs.*—The coxae are similar in shape to those of *Ct. felis* and *canis*. The hindcoxa bears eleven to fifteen stout short spiniform bristles on the inner surface and three bristles on the posterior apical lobe. The hindfemur has two subapical ventral bristles on the outside and a row of three to five on the inner surface. The hindtibia has five dorsal notches, exclusive of the apical one, and on the outer surface a row of eight to ten bristles, besides six to eight placed along the anterior edge. The longest apical bristle of the first hindtarsal segment often reaches to the apex of the second segment, and the corresponding bristle of the second segment

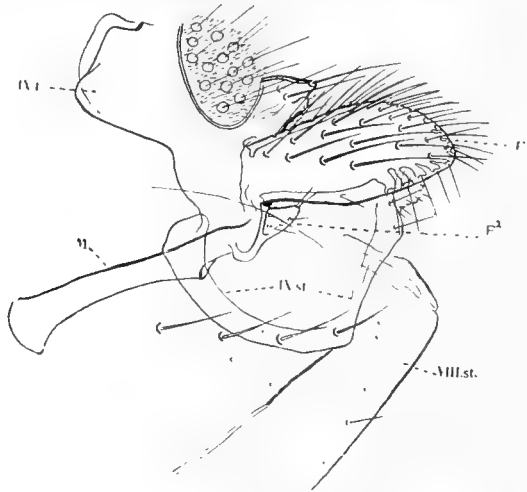


FIG. 7.—*Ctenocephalus craterus*.

frequently extends to the apex of the fourth. The measurements of the mid- and hindtarsi are as follows :

Midtarsus : ♂ 21, 28, 18, 11, 31 ; ♀ 27, 34, 20, 13, 35.

Hindtarsus : ♂ 59, 33, 21, 14, 33 ; ♀ 67, 39, 23, 16, 38.

The proportions vary a good deal in the specimens of different size.

*Modified Segments.*—♂. The eighth sternite (text-fig. 7) has an oblique sub-apical row of three or four bristles and one ventral bristle, besides some minute hairs. The internal portion of the ninth tergite is broader than long, being truncate, with the upper angle about 90° and the lower angle very strongly rounded (IX. t.). The manubrium (M) and the two flaps of the clasper bear a remarkably close resemblance to these organs of *Ct. canis*. The bristles on the outer surface of the large flap F<sup>1</sup> are more numerous and the small flap F<sup>2</sup> is narrower than in *canis*. The outline of the distal portion of the ninth sternite is so much obscured in the specimen from which the figure is taken that we cannot make it out clearly.—♀. The eighth tergite, which has no bristles above the stigma, bears from eight

to fourteen lateral bristles and on the outer side an apical row of eight or nine, rarely as few as six, while there are on the inside three apical bristles and eight somewhat stouter subapical ones. The stylet is strongly conical, being two and a half times as long as it is broad at the base. The bristles of the anal sternite are apical and subapical, as in *canis* and *felis*. The head of the receptaculum

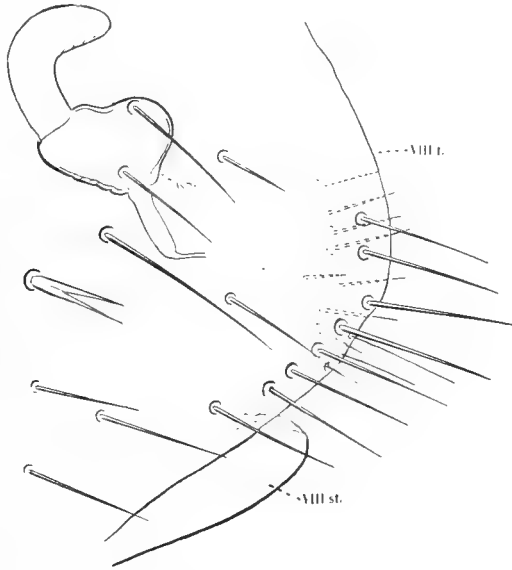


FIG. 8.—*Ctenocephalus craterus*.

seminis (R.S.) is much shorter than the tail; it is widest proximally and incurved dorsally at a short distance from the tail.

Length (mounted specimens): ♂ 2·10 mm., ♀ 2·9 to 3·6 mm.

8 ♂♂ and 29 ♀♀ from Mutaragwa, Aberdare Mts., British East Africa, March 15–17, 1910, off *Dendrohyrax crawshayi*.

1 ♀ from Mutaragwa, March 23, 1910, off *Genette stuhlmanni*.

1 ♀ from Mt. Kinangop, Aberdare Mts., February 27, 1910, off *Arvicanthis pumila*.

The true host appears to be *Dendrohyrax crawshayi*.

### 13. *Ctenocephalus canis* Curtis (1826).

*Pulex canis* Curtis, *Brit. Ent.* iii. No. 114. figs. A–E and 8 (1826); Roths., *l.c.* (1905).

6 ♂♂ and 13 ♀♀ from Voi, British East Africa, April 27, 1910, off *Canis lateralis*.

9 ♂♂ and 12 ♀♀ from Taveta, Kilimanjaro, May 5, 1910, off *Lepus* spec.

11 ♂♂ and 22 ♀♀ from Rumruti, British East Africa, October and November 1910, off *Euxerus erythropus*.

2 ♂♂ and 2 ♀♀ from Rumruti, off *Epimys jacksoni*.

14. *Ctenocephalus felis* Bonché (1835).

*Pulex felix* Bouché, *Nova Acta Ac. Leop. Carol.* xvii. p. 505. No. 4 (1835); *Roths., Nov. Zool.* xii. p. 192 (1905) (differences between *canis* and *felis*).

3 ♂♂ from Eusso Nyiro, British East Africa, January 30, 1910, off *Tachyoryctes ruddi*.

5 ♂♂ and 12 ♀♀ from Voi, from British East Africa, April 16, 1910, off *Mungos ichneumon funestus*.

3 ♂♂ and 16 ♀♀ from Rumruti, British East Africa, October 20 and 27, 1910, off *Lepus victoriae*.

6 ♂♂ and 11 ♀♀ from Rumruti, British East Africa, October 1910, off *Dendrohyrax crawshayi*.

1 ♂ from Rumruti, off *Euxerus erythropus*.

3 ♀♀ from Masaka, Uganda, April 2, 1911, off domestic dog.

1 ♀ from Kagamba, Uganda, July 14, 1911, off man.

Also long series taken at Mombasa from the blankets and beds of natives, July 6, 1910, at Mazeras, British East Africa, off a negro and goats on July 3 and 4, 1910, and on the ground in a Masai Kraal at Laikipia, British East Africa, October 25, 1910.

15. *Ceratophyllus incisus* spec. nov. (text-fig. 9).

♀. Mr. Kemp collected a number of specimens of a species of *Ceratophyllus*, all ♀♀, which agrees well with *C. fasciatus* except in the smaller number of bristles

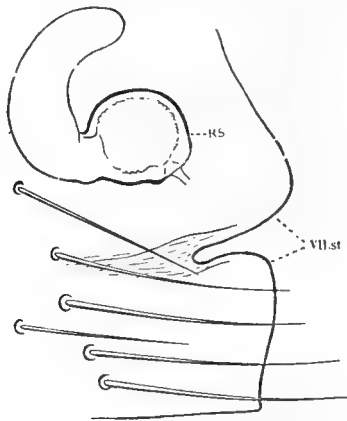


FIG. 9.—*Ceratophyllus incisus*.

on the abdominal sternites and in the shape of the seventh sternite. As in *fasciatus*, the rostrum reaches to the trochanter, the occiput bears one median bristle, not two, and the forefemur a number of small bristles on the outer surface. The comb consists of nineteen to twenty-two teeth. The bristles number six to eight on the sternites of the third to sixth abdominal segment on the two sides together, and on the seventh sternite eight to thirteen. This sternite is divided by a narrow sinus of slightly variable depth into a rounded-triangular upper lobe and a broader truncate



lower one, the segment being more strongly chitinised around the sinus than elsewhere. The eighth tergite has two long bristles below the stigma accompanied by a minute hair, two or three at the apical margin and eight or nine further proximally; on the inside the segment has one apical bristle and a subapical row of three, all short, but almost as stout as the long bristles of the outer surface. The receptaculum seminis resembles that of *C. fasciatus*; the tail narrows perceptibly towards the apex and the head is reticulated on the outer surface,

2 ♀♀ from Mt. Kinangop, Aberdare Mts., British East Africa, February 25, 1910, off *Oenomys bacchante*; type.

14 ♀♀ from Mutaragwa, Aberdare Mts., March 1 to 14, 1910, off *Thamnomys ibeanus*, *Lophuromys zena*, and *Graphiurus microtis saturatus*.

1 ♀ from Aberdare Mts., March 1910, off *Cryptolopha mackenziana*.

1 ♀ from Buhamba, Congo, June 4, 1911, off *Thamnomys dryas*.

### 16. *Ceratophyllus infestus* Roths. (1908) (text-figs. 10 and 11).

*Ceratophyllus infestus* Rothschild, in *Sjöstedt, Kilimandjaro-Meru Exped.*, Siphonaptera, p. 4. t. 1. fig. 6. 7 (1908) (Kibonoto).

As the original figures of *C. infestus* have slightly suffered in reproduction, we take the opportunity of supplementing them with two additional figures taken from the type (♂) and a paratype (♀). The genitalia vary slightly in detail. The type

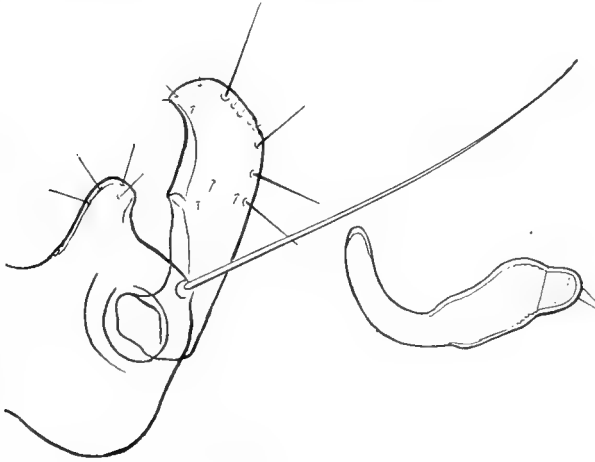


FIG. 10.—*Ceratophyllus infestus*.

FIG. 11.

bears a small hair below the long bristle of the clasper on one side of the body, but not on the other. This hair is absent from the examples collected by Mr. Kemp. The receptaculum seminis (text-fig. 11) is remarkable for its slender shape and projecting mouth.

7 ♀♀ from Mt. Kenia, December 2, 1910, off a squirrel, *Heliosciurus keniae*.

### 17. *Pygiopsylla afer* Roths. (1908).

*Pygiopsylla afer* Rothschild, *Proc. Zool. Soc. Lond.* p. 618. no. 1. t. 29. fig. 7. 8 (1908) (Angola).

1 ♀ from Kagamba, Uganda, July 14, 1911, off *Dasymys medius*.

**Xiphiopsylla** gen. nov.

♂ ♀. The bristles of the head, pro- and mesonotum small, those of the post-median row on the abdominal segments and metanotum long, generally of nearly the same width to near the tip, or even slightly widened distally, the tip not drawn out into a long thin point, these bristles closely resembling a straight sword.

Eye vestigial, quite small and only distinct in optical section, without any pigment. Frontal tubercle triangular in a lateral view, pointed, distinctly projecting downwards; oral angle of frons more strongly produced ventrad than is usual, forming a conspicuous hook in a side view. Genal lobe very broad. Antennal groove of ♀ not continued to the vertex. Maxillary palpus very long and slender, reaching beyond the apex of the forecoxa and being longer than the labial palpus, which consists of five segments.

Pronotum long, with more than one row of bristles, and a comb of sixteen or less spines, the latter not placed close together. The comb is situated at a considerable distance from the ventral edge of the pronotum. Mesonotum without subapical spines on inside. Episternum of the metathorax higher than long.

One antepygidial long bristle in both sexes. In the ♂ the anal tergite separated from the "pygidium" by a distinct suture; the ninth sternite without internal vertical arm, and the eighth sternite large.

Genotype: *X. hippia* spec. nov.

Allied to *Ceratophyllus*, of which it is an offshoot.

18. **Xiphiopsylla hippia** spec. nov. (text-fig. 12, 13 and 14).

♂ ♀. Very strongly chitinised. On the abdomen the chitin is thickest in the centre of the segments, the skeleton appearing very thick on the back and venter in a lateral view. The greater part of the specimen is conspicuously reticulated, the meshes being smaller and more regular in the strongly chitinised portions of the body. Moreover, the abdominal tergites and the posterior halves of the sternites are densely denticulated, and the meso- and metanotum, metepimemum and the abdominal segments I. to VII. have serrate apical edges. The long bristles of the abdomen are shaped like a sword, the lateral ones being faintly widened before narrowing to a point.

*Head.*—The frons is evenly rounded in the ♂ (text-fig. 12), the occiput being horizontal. In the ♀ the dorsum of the occiput slants forward and the frons is less strongly curved than in the ♂. There is a row of six bristles extending from the maxillary palpus obliquely upwards to the antennal groove, and further down a row of three or four bristles, of which the upper one is placed in front of the vestigial eye, an additional fairly long bristle being situated near the antennal groove between the two rows. These bristles vary in length, but the most ventral one is always the longest. The occiput has a few small bristles along the antennal groove, the approximate numbers being six in the ♂ and eight in the ♀. The lateral bristles of the occiput as well as those of the subapical row are exceptionally short, the lateral ones as a rule being arranged in three sets (usually 1, 2 or 3, 1). The first segment of the antenna and the club are very long and slender in the ♂, and the bristles of the first and second segments quite short in both sexes. The proportional lengths of the segments of the maxillary palpus are: 21, 15, 16, 23.

*Thorax.*—The pronotum bears two rows of short bristles. The comb contains fourteen spines, and the distance from the first spine to the ventral edge of the

pronotum about equals the interspace between the first and fifth spines. The lengths of the three thoracic tergites are subdorsally 24, 30, 25. The metepisternum is very much higher than it is long. The lower half of the distal margin of the metepimerum is incurved, so that the apex of this sclerite is almost pointed; the dorsal portion of the apical margin is rounded, the outline being, however, slightly variable. The metepimerum has two or three long bristles below the stigma, and in front of this row about eight or nine small ones, irregularly distributed.

*Abdomen.*—The tergites I to VI in ♂ and I to V in ♀ bear dorsally on the two sides together two to four apical spines. The postmedian row of long bristles contains about twenty-four bristles on the two sides together. The small bristles placed between the long ones are very thin, while the short bristles which are placed in front of the long ones, and of which there are one to three rows, are remarkably

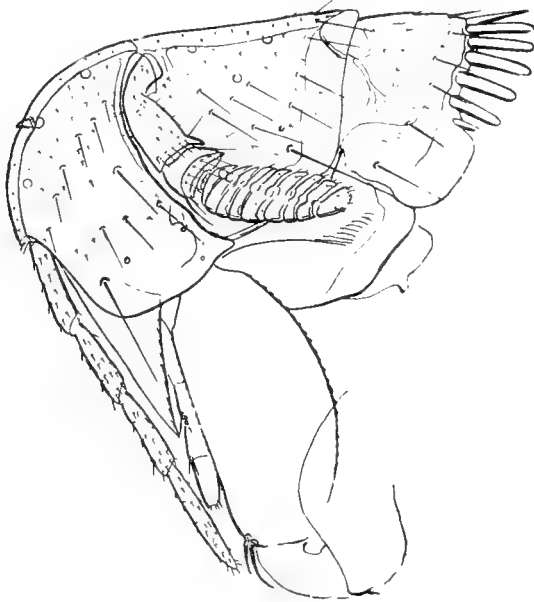


FIG. 12.—*Xiphiopsylla hippia* ♂.

thick. The row of long bristles curves backwards dorsally, and the second to fourth short lateral bristles of the second segment point obliquely downwards. The basal sternite has ventrally one pair of bristles and some very minute hairs, the following sternites bearing on the two sides together a row of twenty to twenty-four long bristles, and a small number of additional shorter bristles.

*Legs.*—The bristles on the coxae, femora, and the outside of the tibiae are small. The subapical posterior sinus of both the mid- and hindcoxae is small and nearly semicircular, the angle above the sinus is prominent, as the hindmargin of the midcoxa is rather abruptly incurved above this angle and that margin of the hindcoxa gently incurved from the angle to beyond the centre. The apical lobe is broad in both these coxae. The forefemur has several small hairs on the outer surface. The hindfemur bears six or seven subventral hairs on the outside, inclusive of the subapical bristle. The mid- and hindfemora have six or seven

pairs of stout dorsal bristles situated in notches, inclusive of the apical pair. The longest bristle of the second hindtarsal segment does not reach the apex of the fourth segment. The measurements of the tarsi are as follows :

Midtarsus : ♂ 22, 17, 12, 9, 22 ; ♀ 21, 16, 11, 8, 20.

Hindtarsus : ♂ 54, 30, 16, 10, 24 ; ♀ 50, 26, 14, 9, 21.

*Modified Segments.*—♂. The eighth tergite (text-fig. 13) has the lower apical angle drawn out into a point, and bears five or six short thick bristles above the stigma, and thirteen to fifteen much longer ones below it (only the apical ones being drawn in our figure). The eighth sternite is about one-fourth longer than it is wide dorso-ventrally, bearing twenty-six to thirty bristles, of which one situated beyond the centre of the ventral margin is very long, being drawn out.

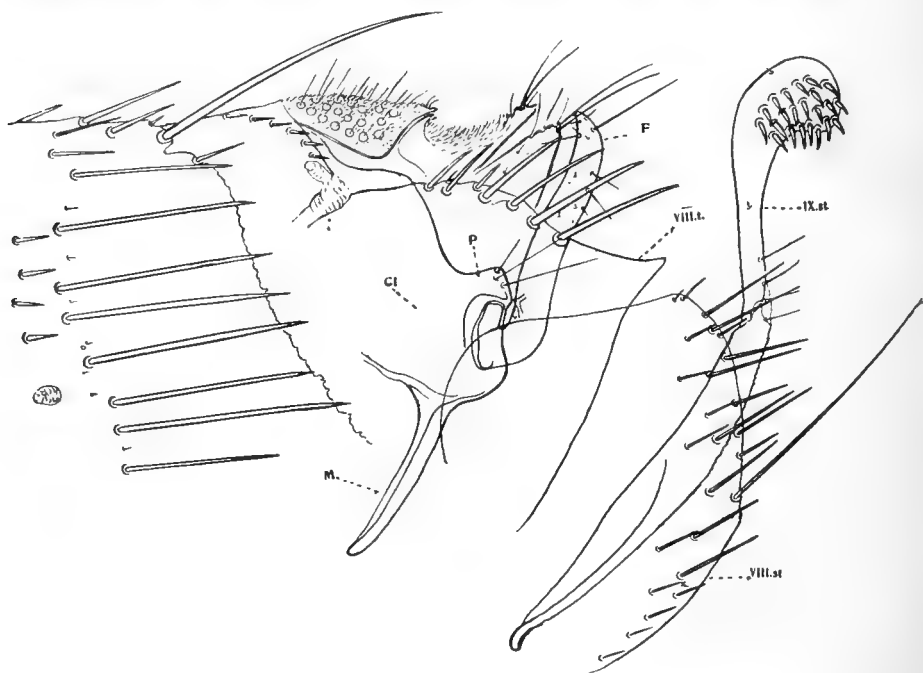


FIG. 13.—*Xiphiopsylla hippia*.

into a long thin point. The dorsal outline of the sensory pygidial plate is nearly straight, but the hind edge of the plate projects backwards, because the anal tergite is hollowed out dorsally. This groove extends across the segment, and is densely clothed with very thin hairs. The clasper (Cl) has a very slender manubrium (M), which bears a groove along the upperside and very slightly bends upwards at the end. Above the insertion of the movable process (F) the clasper is produced into a very short, almost rectangular process (P), which bears two long bristles and one short one. There are no bristles on the clasper near the insertion of the "finger" (F). The latter process is very long and very slender, being of nearly the same width throughout, except for tapering to a point at the apex, which is slightly curved upwards. The two halves of the ninth sternite (IX. st.) are united from the base to the centre, and have one long wire-like internal lever. The distal

portion is claviform, and each club bears on the outer surface numerous short, stout spines, which point downwards. Near the base of the handle of each club there are two or three slender bristles. There is no vertical arm to the ninth sternite.—♀. The seventh tergite is produced into a lobe below the long antepygial bristle; the sternite (text-fig. 14, VII. st.) is longitudinally striated like the eighth segment and the ventral and apical portions of the seventh tergite, and gradually narrows towards the apex, which is truncate, and bears a small sinus. The eighth tergite (VIII. t.) has three to five minute hairs above the stigma, and about as many just below it. The ventral margin of this segment bears six to

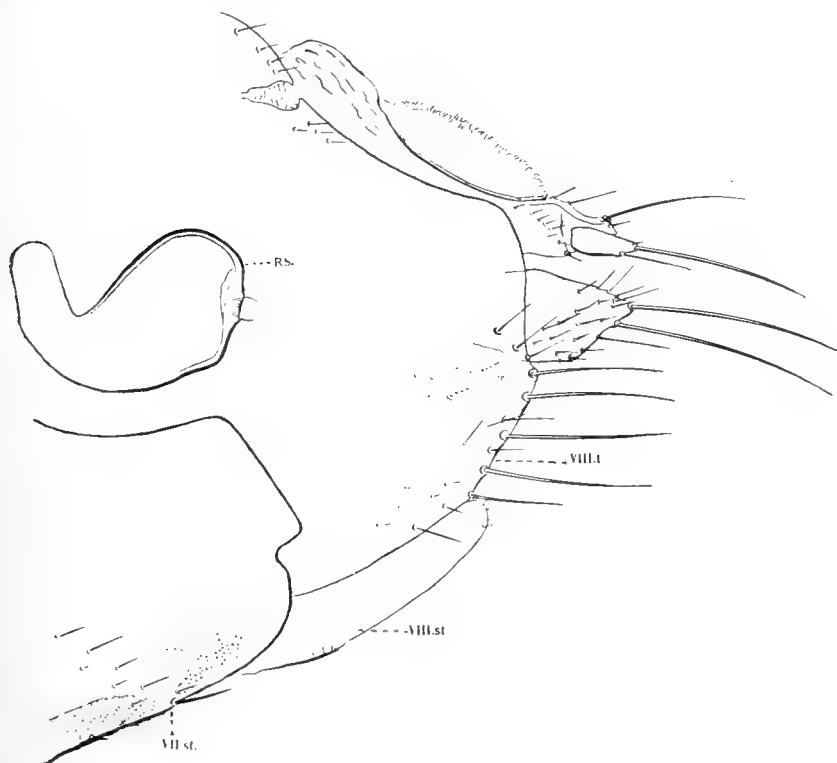


FIG. 14.—*Xiphiosylla hippia*.

eight fairly long but very slender bristles, there being about twelve small hairs at and near the ventral margin, and a patch of six or seven on the inside of the segment. The pygidial plate is more convex than in the ♂, but does not project posteriorly on account of the anal tergite being but very feebly concave near the base. The anal tergite is obtuse, and bears on each side two long slender bristles, all the other bristles being short and thin. The stylet is not quite three times as long as it is broad, being bottle-shaped, and bearing a long apical bristle and two short subapical ones, of which the dorsal one is quite small. The receptaculum seminis has a very large truncate head and a short tail, and resembles to some extent a fig, the head being shorter in the second specimen than in the one figured.

Length (mounted specimens): ♂ 2·8-3 mm.; ♀ 3-3·2 mm.

1 ♂ and 2 ♀♀ from Mutaragwa, Aberdare Mts., British East Africa, March 1-14, 1910, off *Lophuromys zena*.

1 ♂ (type) from Mutaragwa, March 21, off *Epimys jacksoni*.

1 ♂ and 2 ♀♀ from Mt. Kinangop, Aberdare Mts., February 23, 1910, off *Tachyorystes audax*.

1 ♀ from Solai, Mt. Kenia, December 5, 1910, off *Lophuromys zena*.

1 ♂ from Mt. Kenia, December 8, 1910, off the same host.

1 ♂ from Mt. Kenia, December 6, 1910, off *Otomys irroratus elgonis*.

19. *Xiphiopsylla hyperetes* spec. nov. (text-fig. 15).

♂♀. The reticulations of the body and the denticulation of the ridges are very much less pronounced than in *hippia*, the skeleton of the abdomen is not distinctly incrassate dorsally and ventrally, the lobe of the pronotum situated below the comb

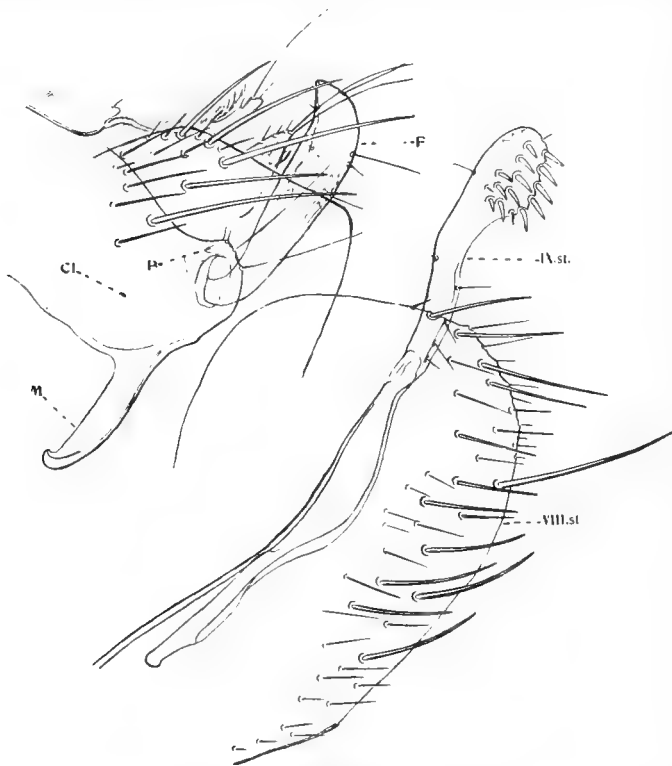


FIG. 15.—*Xiphiopsylla hyperetes*.

and the metepisternum are much broader, the lower angle of the genal process projects much more, and the small bristles of the abdomen are much thinner than in *hippia*. The postmedian row of bristles on the tergites does not curve so distinctly backwards dorsally, and contains a few bristles less; the corresponding row of the sternites consists of only fourteen or less bristles, the small bristles in front of the row of long ones form four to six rows dorsally on the tergites, the

hind edge of the hindcoxa is more rounded, and the angle above the sinus therefore less pointed; and the modified abdominal segments also are different. The pronotal comb contains sixteen spines.

*Modified Segments.*—♂. The eighth tergite bears, above the stigma, about a dozen bristles, which are much thinner than in *X. hippia*. The portion of the segment below the stigma is apically truncate, with the lower angle hardly at all produced, and bears altogether about sixteen bristles, of which seven or eight are long. The eighth sternite is longer and apically more rounded than in *X. hippia*, being widest beyond the centre, and bears a much larger number of bristles (about fifty on each side). The longest of these bristles is placed at the ventral margin in the neighbourhood of the apex. The upper inner angle of the ninth tergite is pointed (in lateral aspect) and the manubrium shorter than in *X. hippia*. The short process (P) of the clasper is rounded, the finger (F) broader and shorter than in that species, and the ninth sternite somewhat different in shape. The dilated apex of this segment is longer than in *X. hippia* and the spines are fewer in number.—

♀. The seventh tergite bears below, and posterior to, the long antepygial bristle, two or three short ones. The seventh sternite is broader than in *hippia*, rotundate-truncate, and does not bear a sinus. The eighth tergite has about twelve small bristles above the stigma and four below it. The ventral portion of this sclerite is truncate at the apex, with the angles rounded, and bears along the ventral edge five or six bristles accompanied on the inside by four small ones; above the most distal marginal bristles there are two smaller ones, the lateral outer surface bearing about ten to twelve small bristles, and the inner surface seven or eight slightly stouter ones. The stylet and the anal sternite are longer than in *hippia*, and the bristles at the apex of the latter much more numerous. The receptaculum seminis is remarkably different, closely agreeing with that of the next species. It is much more strongly chitinised, the head asymmetrically ovate with the mouth produced.

Length: ♂ (mounted) 3.9 mm.; ♀ (not mounted) 4.1 mm.

1 ♂ from Mutaragwa, Aberdare Mts., British East Africa, March 1 to 14, 1910, off *Lophuromys zena*.

1 ♀ from Mt. Mikeno, Belgian Congo, off *Lophuromys spec.*

## 20. *Xiphiopsylla apriona* spec. nov. (text-fig. 16).

♀. Similar to *X. hyparettes*, but at once distinguished by the apices of the abdominal segments not being serrate.

There is no regular reticulation even on the more incrassate central parts of the abdominal segments, nor are the ridges denticulate as in the two preceding species.

The lower angle of the genal process is much more rounded than in *X. hyparettes*. The pronotal comb contains only twelve spines, the lobe below the comb being broader (in a vertical sense) than the pronotum, exclusive of the comb, is long dorsally. The proportional lengths of the pro-, meso- and meta-nota are 24, 40, 30. The long bristles of the abdominal tergites are distally slenderer than in the previous species, but still resemble a straight sword, whereas the bristles of the sternites taper gradually from the base to the tip, not differing from ordinary bristles. The postmedian row of the sternites contains at most twelve bristles. The small bristles placed in front of the postmedian row of the tergites are less

numerous than in *X. hyparetes*. The seventh tergite bears only one short bristle below the long autepygidial one. The seventh sternite is as broad as in *X. hyparetes*, but is more rounded and is not longitudinally striated like the eighth tergite, but vertically, the lines on the apical area of the segment being very close together. The eighth tergite has about a dozen small bristles above the stigma and four to eight below it; its apex is more rounded than in *X. hyparetes* and *hippia*. The bristles on the ventral portion of this sclerite agree with those of *X. hyparetes*,

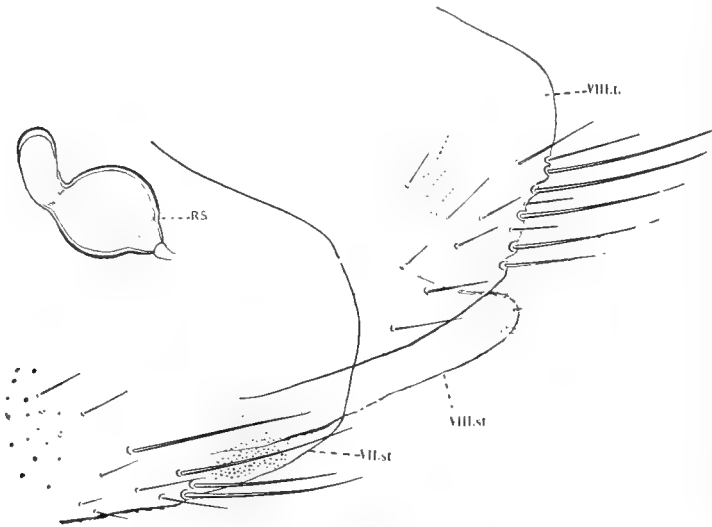


FIG. 16.—*Xiphiopsylla apriona*.

except that there are less on the inner surface. There is also no essential difference in the anal segment between these two species. The receptaculum seminis likewise is nearly the same as in *hyparetes*.

3 ♀♀ from Mt. Kenia, British East Africa, December 14 and 15, 1910, off *Tachyoryctes* spec.

## 21. *Listropsylla dolosus* Roths. (1907).

♀. *Listropsylla dolosus* Rothschild, *Ent. Mo. Mag.* (2) xviii. p. 175. no. 2 (1907) (Kikuyu Escarpment Brit. E. A.).

Mr. Kemp obtained both sexes of this species. The ♂ almost exactly agrees with *L. stygius* Roths. (1908), described as *Ceratophyllus stygius* in *Ent. Mo. Mag.* (2). xix. p. 77. no. 3. t. 1. fig. 3 (1908) from a single ♂ collected by A. F. R. Wollaston on the Ruwenzori Mts. The "finger," however, is slightly different in the two forms, being broader in *stygius* than in *dolosus*. In *dolosus* the long ventral bristle of the "finger" is placed at three-fifths, and in *stygius* at two-thirds, *i.e.* the distance from the base of the "finger" to the bristle is in *stygius* twice as long and in *dolosus* half as long again as the distance from the bristle to the apex of the "finger." The two insects are presumably geographical forms of the same species. Both in *dolosus* and *stygius* the ventral genal margin bears some short, flat, cordiform teeth, and the first midtarsal segment is twice as long as the second.



1 ♀ from Mutaragwa, Aberdare Mts., British East Africa, March 13, 1910, off *Graphiurus microtis saturatus*.

1 ♀ from Mutaragwa, March 24, 1910, off *Dendromys nigrifrons*.

2 ♂♂ from Mutaragwa, March 4, 1910, off *Epimys jacksoni*.

1 ♀ from Mt. Kenia, December 1910, off *Lophuromys* spec.

1 ♂ and 2 ♀♀ from Mt. Kenia, December 1910, off *Epimys medicatus*.

1 ♀ from Mt. Kenia, December 1910, off *Arvicanthis* spec.

1 ♂ from Mt. Kenia, December 1910, off *Otomys irroratus elgonis*.

1 ♂ from Kilimandjaro, May 13, 1910.

1 ♀ from Kigezi, Uganda, April 9, 1911, off *Lophuromys* spec.

2 ♀♀ from Kigezi, April 25, 1911, off *Arvicanthis* spec.

1 ♀ from Kigezi, April 26, 1911, off *Lophuromys* spec.

### **Ctenophthalmus** Kolen. (1856).

The genus appears to be very abundantly represented in Africa south of the Sahara. The species from tropical Africa, however, though undoubtedly closely related to some of the Palaearctic forms, do not exactly conform to the generic diagnosis based on the European species. The number of plantar bristles present on the fifth segment of the hindtarsus is generally considered of taxonomic value in *Ctenophthalmus* and allied genera, being quite constant in the European species. The Ethiopian *Ctenophthalmus*, however, prove that one must not lay too much stress on a single character of this kind. Only one of the nine species of *Ctenophthalmus* from tropical Africa has three pairs of lateral bristles on that tarsal segment, as in all the European species, the other forms bearing three bristles on one side of the segment and four on the other, or four on both sides, or three pairs on one hindtarsus and three and a half pairs on the other, the numbers fluctuating within the same species and sometimes being different on the right and left hindtarsus of the same individual. The European *Ctenophthalmus*, with the exception of *Ct. rettigi* Roths. (1908), moreover, are characterised by bearing a curved hair at the tip of the labial palpi, which is not the case in any tropical African form. All of them, however, have the three genal spines typical of this genus, a pointed frontal tubercle situated in a groove, a vestigial eye, two rows of bristles on the frons, a short pronotum bearing one row of bristles, etc. The hind-coxa has no patch or row of spines on the inside, and the fifth segment of all the tarsi bears a ventral proximal pair of bristles in between the first lateral pair.

Four species of *Ctenophthalmus* have been described from Africa south of the Sahara: *calceatus* Waterst. (1912), *ansorgei* Roths. (1907), *engis* Roths. (1907), and *triodontus* Roths. (1907). "*Typhlopsylla*" *ingens* Roths. (1900), as pointed out on p. 562 of the present paper, does not belong to the genus *Ctenophthalmus*.

A. Proboscis reaching close to apex of forecoxa; three or four bristles beneath stigma on abdominal tergites II and III; longest apical bristle of second hind-tarsal segment reaching beyond apex of fourth segment; surface-sculpture faint, particularly weak on the legs; metepimerum with more than ten bristles.—These characteristics sharply distinguish *Ct. triodontus* and a nearly allied new species from all the other African ones.

22. *Ctenophthalmus audax* spec. nov. (text-figs. 17 and 18).

In this species and *C. triodontus* the bristles are more numerous than in any other tropical African species. *Ct. audax* is differentiated from *Ct. triodontus* in the ♂ by the movable process of the clasper not being abruptly dilated distally, and in the ♀ by the basal abdominal sternite bearing a number of lateral bristles.

*Head.*—The first and second genal bristles are much shorter and more obtuse than the third, the second one being especially blunt. The frons bears two rows of bristles and the occiput three rows.

*Thorax.*—The pronotal comb consists of sixteen spines. The two lower bristles of the pronotal row are much closer together than the other bristles of the same row. The mesopleura bear eleven or more bristles, the metepisternum has three or four, the metasternum one or two, and the metepimerum thirteen to sixteen.

*Abdomen.*—The abdominal tergites I and II in the ♂ and I—VII in the ♀

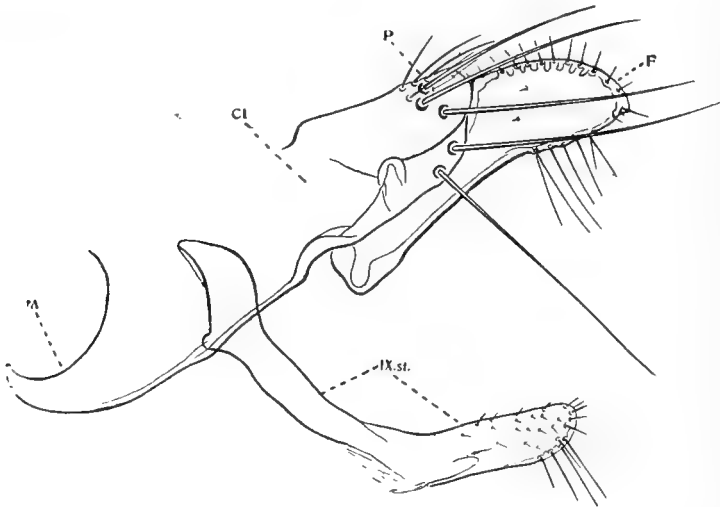


FIG. 17.—*Ctenophthalmus audax*.

have, like the metanotum, two complete rows of bristles, three or four bristles of the posterior row being placed below the stigma, at least on segments II and III, on segment II there is also a bristle of the anterior row placed below the stigma. The sternites of segments III to VI bear in the ♂ on each side a row of four or five bristles, there being rarely a bristle in front of the row, in the ♀ the row contains seven to nine bristles, and there are from four to six bristles in front of the row, the basal sternites bearing in this sex three to six lateral bristles on each side.

*Legs.*—The mid- and hindcoxae bear posteriorly near the apex one long and one small bristle. The femora have no lateral bristles, except for a small one on the inner surface of the forefemur. There are two subapical ventral bristles on the mid- and hindfemora, and one such bristle on the inner side. This latter bristle is long and thin, particularly on the hindfemur, not being short and stumpy as in European *Ctenophthalmus*. The mid- and hindtibiae have one row of bristles on the outer surface near the dorsal bristles. The first hindtarsal segment bears one or two apical bristles which reach to the apex of the second segment, and two

apical bristles of this latter segment extend to (respectively beyond) the apex of the fourth segment, which segment is only a little longer than it is broad. The fifth hindtarsal segment has three or four lateral bristles, the number differing frequently in the right and left legs, and the true inner edge of the segment (in slide usually anterior) has often only three bristles, when the outer (in slide posterior) bears four. It is the third bristle which varies.

*Modified Segments.*—♂. The eighth tergite has three small bristles above the stigma, and the sternite a row of five or six long ones, below and proximally to which there are five or six smaller bristles. The process (P) of the clasper (text-fig. 17) is broad and non-sinuate, bearing a number of slender bristles at the upper edge and a transverse, curved, lateral row of five very long ones. The movable process (F) is of the type exhibited by *C. caucasica*. Its ventral edge is gently incurved, not angulate, while the dorsal edge is elbowed opposite the tip of the non-movable process P, being incurved proximally to this angle, and convex

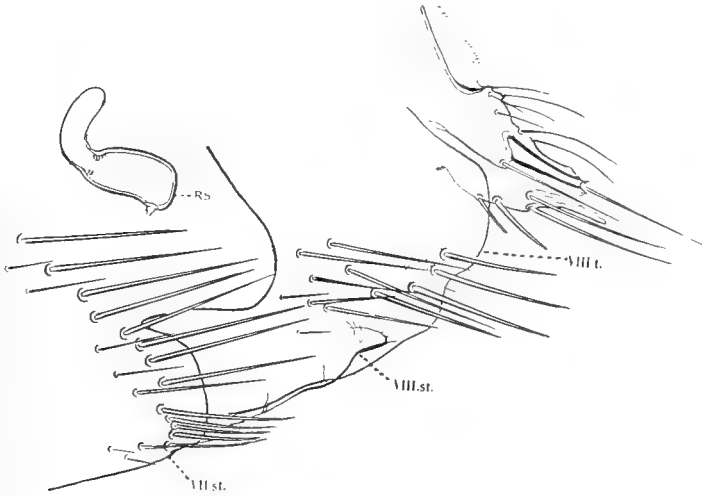


FIG. 18.—*Ctenophthalmus audax*.

between it and the slightly dentiform distal angle. F is provided with ten to thirteen short, pointed bristles along the dorsal edge between the dorsal angle and the tip, and with six long bristles at the ventral edge, there being also some slender bristles ventrally at the tip and a number of other small bristles on both the inner and outer surfaces. These small bristles are particularly numerous on the inner side. The ninth sternite is sub-acuminate, the dorsal edge of the ventral arm being nearly straight and the distal portion of the ventral edge rounded. There is a row of three to five long and slender bristles ventrally near the apex of this sclerite, and about sixteen small bristles distributed over the sides and the edges of its apical half. The anal tergite has on each side about a dozen bristles, the most proximal ones being placed at a short distance from the base of the segment and there being near the apex one longer one on each side. The anal tergite bears only a pair of long bristles on each side.—♀. The seventh sternite has a deep sinus as in *Ct. triodontus*, but the sinus is (text-fig. 18) narrower than in that species. The lobe situated above it is variable in width. The segment bears

on each side a row of twelve to fourteen long bristles, and in front of it eight to fourteen more bristles, some of which are situated close to the row and are also long. The eighth tergite has one to three small bristles above the stigma, a ventral patch of eleven to fourteen, and an internal patch of eight small ones. The eighth sternite (VIII. st.) is somewhat contracted in the specimen from which our figure is taken. The anal sternite bears on each side a moderately long, stout bristle in the middle, sometimes accompanied by a smaller one, and a subapical pair of long ones. The stylet is long and slender, surpassing in length the third hindtarsal segment. Below the stylet there is a solitary long bristle on the anal tergite. The head of the receptaculum seminis (R.S.) is twice as long as it is broad, being also longer than the tail.

The sculpture of the surface of the body and legs is very feeble in both sexes, the lines being hardly traceable on the legs.

Length (mounted specimens): ♂ 3.2 mm., ♀ 3.5 mm.

13 ♂♂ and 20 ♀♀ from Mt. Kinangop, Aberdare Range, Brit. E. Africa, 11,000 ft., February 23, 1910, off *Tachyoryctes audax*;—type.

1 ♀ from Mt. Kinangop, February 24, 1910, off *Otomys irroratus*.

7 ♂♂ from Mt. Kinangop, February 28, 1910, found in killing bottle.

4 ♂♂ and 3 ♀♀ from Aberdare Mts., February 13, 1910, off *Tachyoryctes audax*.

B. Proboscis not nearly reaching to apex of forecoxa; at the most two bristles below stigma on abdominal tergites II and III; longest apical bristle of second hindtarsal segment at most extending to the base of the fourth segment; metepimerum with less than ten bristles.

### 23. *Ctenophthalmus eumeces* sp. nov. (text-fig. 19).

Only the ♂ known to us.

*Head*.—The spines of the genal comb are pointed. The rostrum reaches to the apical third (about) of the forecoxa. The frons bears two rows of bristles, and the occiput three rows.

*Thorax*.—The pronotal comb contains sixteen spines. There are ten bristles in the postmedian row on the three thoracic tergites on the two sides together, the two lower ones being rather further apart than the others. The mesopleura bear eight bristles, the metepisternum two, and the metepimerum five to seven arranged in two rows.

*Abdomen*.—Each tergite bears two rows of bristles, the first tergite having an incomplete third row. The first bristle of the posterior row is placed below the stigma, while the first bristle of the preceding row is placed above the stigma. The sternites of segments III to VI have on each side a row of three bristles, and in front of it one or two, seldom three, additional smaller bristles, segment VII bearing in the type-specimen four bristles in the postmedian row.

*Legs*.—The small apical ventral bristle on the inner surface of the hind-femur is short and rather stout. The longest bristle of the second hindtarsal segment reaches a little beyond the apex of the third segment. The fourth segment is not quite twice as long as it is broad in the hindtarsus. The

fifth segment of the same foot bears three plantar bristles on one side and four on the other, or four on both sides.

*Modified Segments.*—♂. The eighth sternite has four long and from six to nine shorter bristles. The distal process (P, text-fig. 19) of the clasper is broad and obtuse, being slightly notched at the upper margin. It bears a row of six or seven long bristles, slightly variable in position, and at the dorsal margin some smaller ones in addition. The movable process F is longer and slenderer than in any other African species known, and has at the upper edge seven to nine short spiniform bristles, ventrally near the apex two slender bristles and

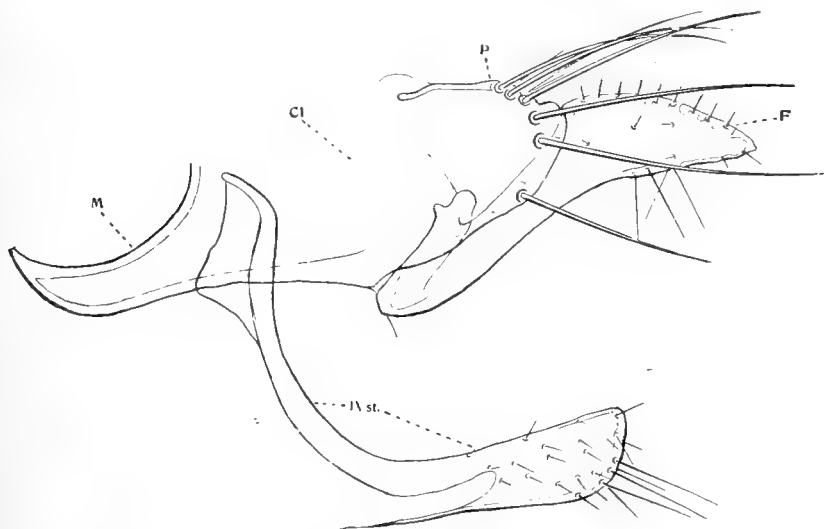


FIG. 19.—*Ctenophthalmus eumeces*.

farther proximally a cluster of four or five, which are much slenderer than in *Ct. audax*. The ninth sternite is almost the same as in *Ct. audax*, except for its slightly larger width.

1 ♂ from Mt. Kenia, British East Africa, December 19, 1910, off *Arvicanthus pumilio*;—type.

1 ♂ from the Igembi Hills, north-east of Mt. Kenia, British East Africa, February 12, 1911, off *Oenomys* spec.

#### 24. *Ctenophthalmus cabirus* spec. nov. (text-figs. 20 and 21).

♂♀. Very close to *Ct. ansorgei* Roths. (1907) and *calceatus* Waterst. (1912), distinctly differing in the modified abdominal segments of the ♂.

The process P of the clasper (Cl, text-fig. 20) is divided into two lobes, as in *calceatus*, the sinus being much deeper and the lobes therefore longer than in *ansorgei*. The upper lobe bears three bristles as in *calceatus*. The movable process F is twice as long as it is broad at the widest point, being shorter but not narrower than in *ansorgei*, and longer than in *calceatus*. The ninth sternite (IX st.) bears a larger number of small bristles than in *ansorgei*.

The ♀ does not present any reliable difference from that sex of *ansorgei*, the specimens being somewhat variable *inter se*. The sinus of the seventh sternite (text-fig. 21, VII. st.) divides the segment into a broad upper lobe and a smaller

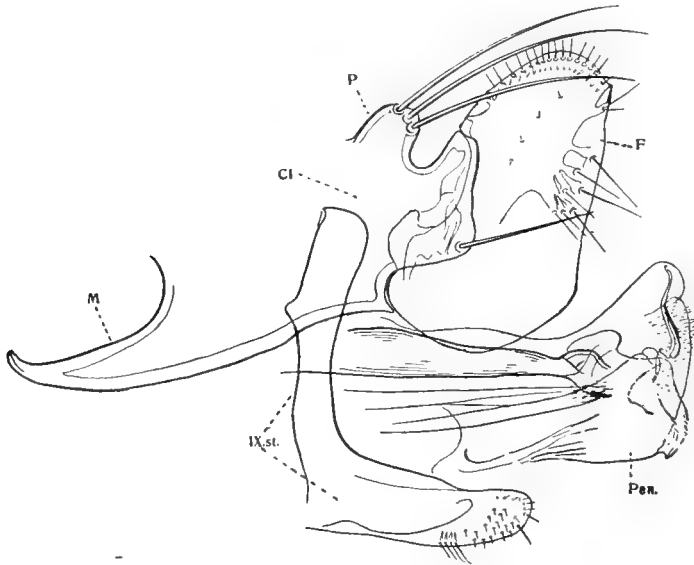


FIG. 20.—*Ctenophthalmus cabirus*.

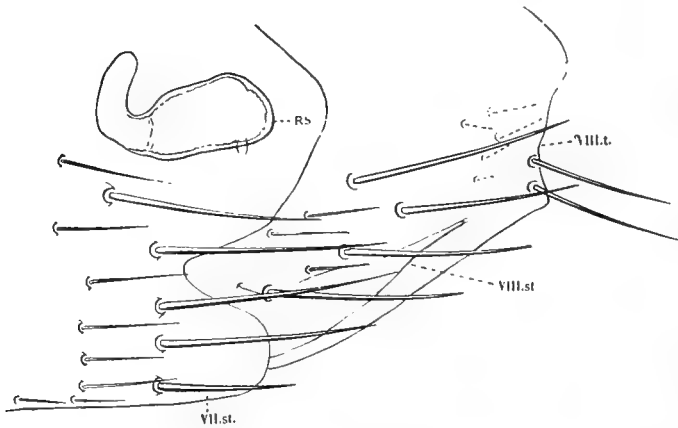


FIG. 21.—*Ctenophthalmus cabirus*.

lower one. The eighth tergite has two bristles at the apical edge above the ventral angle. The head of the receptaculum seminis is longer than the tail.

1 ♂ from Mbarara, Uganda, April 3, 1911, off a rodent.

1 ♀ from Mbarara, July 25, 1911, off *Oenomys* spec.

1 ♂ and 1 ♀ from Rumruti, British East Africa, September 28, 1910, off *Arvicanthus massaicus*.

1 ♀ from Nalasanji, Uganda, July 8, 1911, off *Otomys* spec.

1 ♂ from Nalasanji, Uganda, July 8, 1911, off *Lophuromys ansorgei*.

2 ♀♀ from Kigezi, Uganda, April 10 and 27, 1911, off rodents.

4 ♂♂ and 4 ♀♀ from Kumba, Uganda, June 30, 1911, off *Otomys* spec.;—type.

1 ♀ from Masaka, Uganda, March 22, 1911, off *Arvicanthis abyssinicus rubescens*.

1 ♀ from Nairobi, British East Africa, September 12, 1910, off *Epimys* spec.

1 ♀ from Igembi Hills, British East Africa, February 13, 1911.

1 ♀ from Mt. Kenia, December 7, 1910, off *Lophuromys zena*.

We add the description of a new species collected by Dr. W. J. Ansorge.

25. *Ctenophthalmus atomus* spec. nov. (text-fig. 22).

♀. Differs from *Ct. ansorgei* in the shape of the seventh abdominal sternite. This segment, instead of being divided by a narrow and deep sinus into two lobes, bears one large truncate-emarginate lobe, below which the edge of the segment runs obliquely downward and forward, as shown in fig. 22.

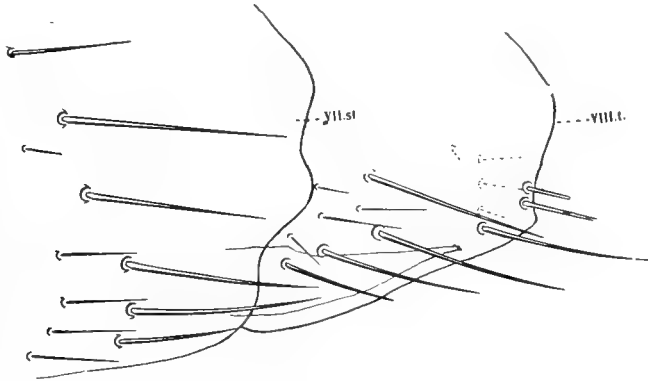


FIG. 22.—*Ctenophthalmus atomus*.

The eighth tergite closely agrees with that of *Ct. ansorgei* and *cabirus*. It bears two apical bristles (both broken in our specimen), as in those species, also a ventral row of four, and above the row one long and four short bristles.

1 ♀ from Ndala Tando, Angola, December 18, 1908, off *Arvicanthis rufinus* (Dr. W. J. Ansorge).

26. *Ctenophthalmus acanthurus* spec. nov. (text-figs. 23 and 24).

♂♀. Evidently a near ally of *Ct. engis* Roths. (1907), of which only the ♀ is known. The ♀ of *acanthurus* differs from that of *engis* in the shape of the seventh abdominal sternite and in the longer head of the receptaculum seminis. In the ♀♀ of both species the ventral row of bristles on the eighth tergite terminates with a short bristle, which is placed at the apical margin of the segment. The ♂ of *acanthurus* is easily recognised by the ninth sternite bearing a row of short, stout spine-like bristles at the ventral margin.

*Head*.—The genal spines are pointed. The genal process is nearly twice as broad as the second genal spine.

*Thorax.*—The mesonotum bears three rows of bristles, besides a basal row which extends down to the second pronotal spine, and a number of additional small bristles on the back and the sides. There is, in fact, only a small lateral area bare of bristles. The mesopleura bear seven, and the metepisternum five or six bristles.

*Abdomen.*—Segments I to VI have no obvious distinctive characteristics. They bear two rows of bristles on the tergites with an incomplete third row on the first tergite and one or two dorsal bristles in front of the rows on the other tergites. The sternites of segments III to VI have, in the ♂, usually a row of six bristles on the two sides together, and two to six additional bristles, the ♀ bearing, as a rule, eight bristles in the row and four to six in front of it.

*Legs.*—In the hindtarsus the second segment bears one apical bristle, which reaches to the apex of the third segment; the fourth segment is twice as long as it

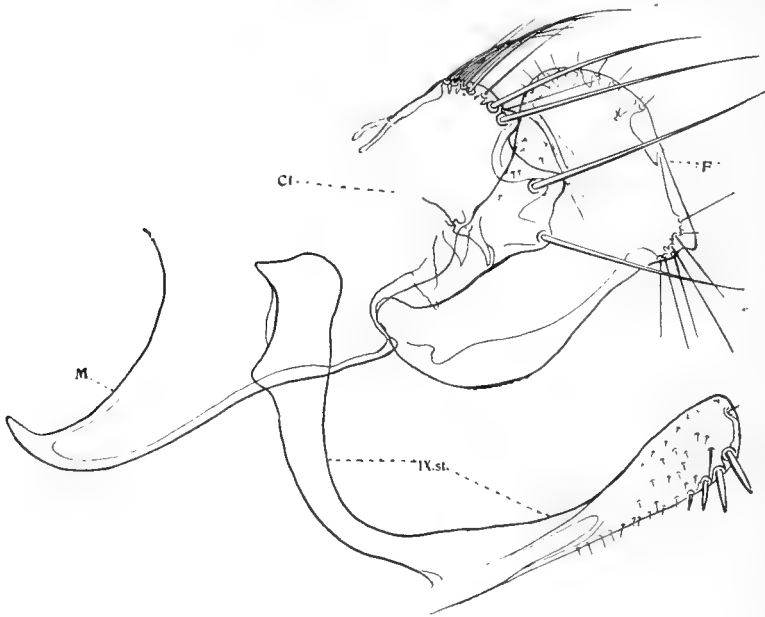


FIG. 23.—*Ctenophthalmus acanthurus*.

is broad, and the fifth segment has four lateral bristles. The proportional lengths of the hindtarsal segments are: ♂, 41, 30, 19, 12, 20; ♀, 42, 31, 20, 12, 20.

*Modified Segments.*—♂. The eighth sternite is broadly rounded, and bears on each side six to nine bristles, of which three (more rarely only two) are long. The clasper (text-fig. 23) terminates in a broad and short process which is divided by a very shallow apical sinus into two lobes, the sinus being deeper on the inner side of the clasper than on the outer surface. The upper lobe is rounded and bears about a dozen bristles at the edge. The ventral angle of this lobe is produced on the inner side of the clasper into a short, subtruncate, strongly chitinised projection. The lower lobe is very obliquely truncate, and bears a long bristle at the ventral angle and another on the outer surface. The movable process (F) has a characteristic shape. Its ventral margin is rounded from the base to three-fourths its length and then incurved, the apical ventral angle of the finger distinctly projecting downward.



Close to this "nose" there are five ventral bristles, and above it two more bristles, one of which is quite short. The dorsal portion of the finger is very strongly rounded-dilated, as shown in the figure, and bears a row of about nine short, spine-like bristles along the most dorsal part of the edge, the distal ones of these bristles being the thinnest. The inner arm of the ninth sternite is rather strongly curved, its apical dilated portion being twice as long as this portion is wide at its centre. The ventral arm is as long as the vertical one, bears numerous small bristles on the sides and at the ventral margin, one small stiff bristle at the apical margin, and a row of four stout, short, strongly chitinised ones at the apical portion of the ventral margin.—♀. The seventh sternite (text-fig. 24) exhibits a row of nine or ten long bristles (on the two sides together), besides some small bristles, and is divided by a deep sinus into a very broad upper lobe and a much narrower rounded lower one. The ventral edge of the upper lobe is excurved near the apex of the sinus, which is rendered very narrow in consequence. The eighth tergite has no bristles above the stigma, and bears a ventral

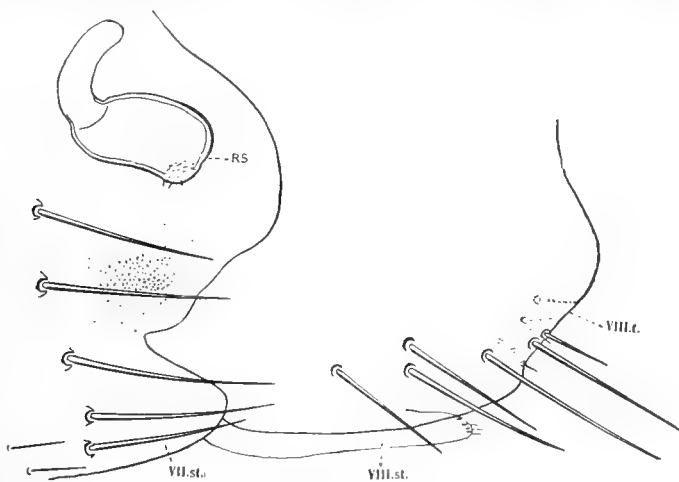


FIG. 24.—*Ctenophthalmus acanthurus*.

row of five or six strong bristles, of which the last is short and placed close to a long one, both being situated practically at the apical edge of the segment. Above this row there is one long bristle, and more proximally than this bristle often one or two small ones. The upper angle of the dilated ventral portion of this segment is sometimes acuminate, sometimes rounded. On the inner surface of the segment are six or seven small bristles. The eighth sternite is broader than usual, its apex being much less narrowed than in the other African species. The stylet is conical, being nearly three times as long as it is broad at the base. The anal sternite bears seven bristles. The head of the receptaculum seminis (R.S.) is longer than the tail.

1 ♂ from Mt. Kinangop, Aberdare Mts., 11,000 ft., British East Africa, February 27, 1910, off *Dendromys insignis*;—type.

1 ♀ from Mt. Kinangop, February 27, 1910, off *Leggada* spec.

3 ♂♂ from Mt. Kinangop, March 1, 1910, off *Crocidura fumosa*.

2 ♂♂ and 6 ♀♀ from Mutaragwa, Aberdare Mts., March 24, 1910, off *Dendromys nigrifrons*.

- 1 ♂ from Mutaragwa, March 13, 1910, off *Graphiurus microtis saturatus*.  
 1 ♂ from Mutaragwa, March 11—14, 1910, off *Thamnomys ibeanus*.  
 2 ♂♂ from Mutaragwa, March 13, 1910, off *Epimys jacksoni*.  
 1 ♂ from Mt. Kenia, December 1910, off *Lophuromys zena*.

27. *Ctenophthalmus lycosius* spec. nov. (text-figs. 25 and 26).

♂♀. A species remarkable for the peculiar shape of the male genitalia. In the number and arrangement of the bristles, apart from the modified segments, this species agrees almost exactly with *Ct. acanthurus*, *engis*, and others. The genal spines are pointed. The genal process in the ♂ is a little broader than the second genal spine, and in the ♀ half as broad again. The lobe of the pronotum situated below the comb is broader than in the allied species, its vertical diameter being equal to the distance from the lower edge of the first spine in the ♂ to the upper edge of the third, and in the ♀ nearly to the centre of the fourth spine. The second hindtarsal segment bears an apical bristle which reaches beyond the third segment, and another which extends to the apex of that segment. The mesopleura of the ♀ bear eight or nine bristles.

*Modified Segments*.—♂. The eighth abdominal sternite bears on each side

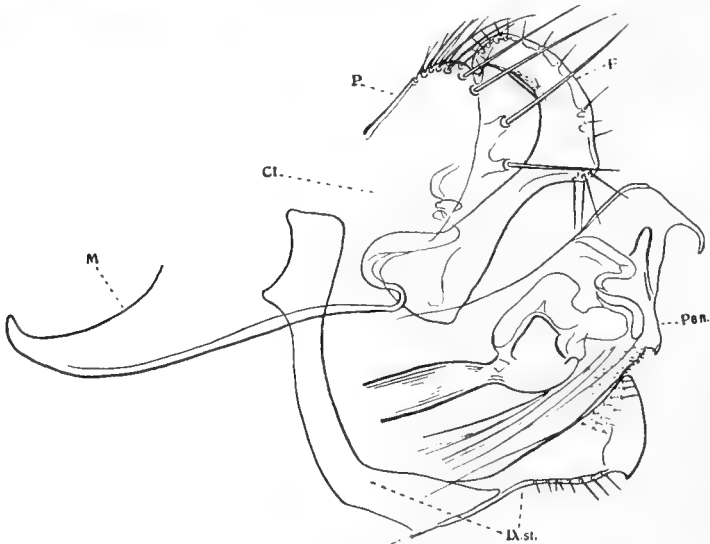


FIG. 25.—*Ctenophthalmus lycosius*.

about nine bristles, of which the three distal ones are the longest. The clasper (Cl, text-fig. 25) terminates in an almost square process (P) which is rounded-truncate distally, the apical margin being divided by a very small sinus into a short upper and a longer lower portion. Above this sinus there are about eight bristles arranged in a double row, the outer row being continued ventrad by three long bristles, of which the last is placed near the ventral margin. The movable process F is distally dilated both dorsally and ventrally, resembling a hammer. There are four long bristles at the truncate ventral angle of F, while the strongly rounded dorsal margin bears a row of spiuiform bristles, a few similar bristles, variable in

number and some of them rather long but thin, being placed at the distal (or apical margin). The ninth sternite is very unlike that of every other known African species. Its horizontal arm strongly widens apically, the ventral margin remaining nearly straight to the apex, while the dorsal margin gradually runs upwards, forming an acute, but slightly rounded, angle with the gently convex distal margin. The ventral angle is produced downward into a sharp tooth. The segment has only short bristles, a row of seven or eight being placed at the ventral margin and a patch of about sixteen dorsally near the apex.—♀. The seventh sternite (text-fig. 26) bears on the two sides together in our single specimen an interrupted row of thirteen bristles, and in front of the row twelve additional bristles. The segment is deeply divided by a very large sinus into a broad upper lobe and a short lower one. The upper lobe is truncate-sinuate, with the upper angle strongly rounded, the ventral angle produced (much as in *C. engis*), and the ventral margin horizontal. The lower lobe is much shorter than the upper

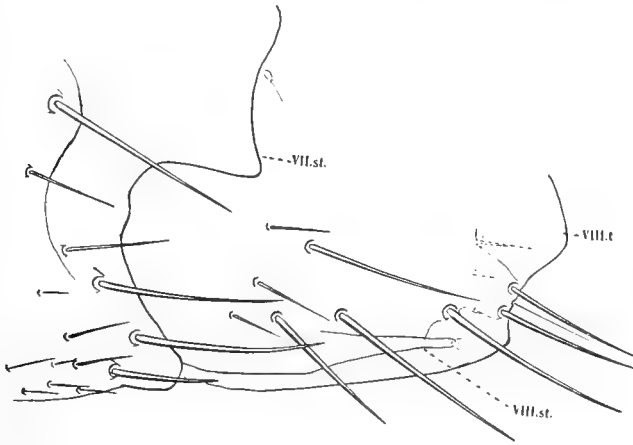


FIG. 26.—*Ctenophthalmus lycosius*.

one, and its upper margin is strongly slanting, being dilated into a very small, obtuse additional lobe near the upper lobe. The eighth tergite has no bristles above the stigma. There is a ventral row of six bristles on this segment (VIII. t.), of which the first is small and the last two, which are long and differ but slightly in size, are placed close together at the apical margin, which is incurved. Above the row there is one long bristle accompanied by two or three smaller ones, while the inner surface bears one or two short but fairly strong bristles and two or three exceedingly small ones. The anal sternite has eight bristles on the two sides together. [The receptaculum seminis has accidentally been destroyed in mounting the specimen.]

2 ♂♂ and 1 ♀ from the Aberdare Mts., British East Africa, February 17—21, 1910, off *Lophuromys zena*.

Another ♀, taken by Mr. Kemp in the same district on February 25 off *Oenomys bacchante* agrees on the whole so well with the ♀ of *lycosius* that we place it here. The mesopleura of this example bear nine or ten bristles, and the seventh abdominal tergite has three antepygidial bristles on one side and four on the other; the seventh sternite also being slightly different on the two sides of the body. The

lower angle of the upper lobe of this segment is very little produced and much more broadly rounded off than in the ♀ described above. The lobe of the right side bears an additional small lobe ventrally, which is absent from the lobe on the left side. The ventral lobe is shorter than in the true ♀ of *lycosius*, and the bristles in front of the row on the seventh sternite are more numerous (nineteen on the two sides together). The eighth tergite has above the row one long bristle and three small ones on one side and five small ones on the other, there being five bristles on the inner surface on each side. The anal sternite has ten bristles. The receptaculum seminis resembles that of *Ct. engis* in the head being shorter than the tail, though the head is not quite so short as in *engis*. The specimen possibly represents a distinct species.

28. *Ctenophthalmus cophurus* spec. nov. (text-figs. 27 and 28).

*Head*.—The first spine of the genal comb is slender and, like the third, sharply pointed, the second spine being the broadest and having an obtuse apex. The genal process is narrower than usual, which is particularly noticeable in the ♀, in which sex the width of the process does not much exceed that of the second genal spine measured in the centre; the upper edge of the process, moreover, is not distinctly elbowed, as it is in the ♀♀ of most other species.

*Thorax*.—The third spine of the comb is half as long again as the pronotum. The lobe below the comb is narrow, its diameter being equal or inferior to the distance from the lower edge of the second spine to the upper edge of the third measured in the middle. The mesonotum bears two rows of bristles, a few additional dorsal bristles and a series of small basal ones. This latter series only extends as far as the fourth pronotal spine, there being consequently a lateral area on the mesonotum between the basal edge and the two rows of bristles which is devoid of bristles. The mesopleura have seven bristles, the metepisternum has two, and the metepimerum six to nine, usually seven.

*Abdomen*.—The tergites bear two rows of bristles, the first tergite having a few additional dorsal ones. The first bristle of the second row, and on the second tergite also the first of the anterior row, are placed below the stigma. The basal sternite has no lateral bristles in either sex. The sternites of segments III to VI have in the ♂ a row of six to eight bristles on both sides together, and two to six smaller bristles in front of the row, the numbers being slightly larger in the ♀ and the bristles rather stronger.

*Legs*.—The apical ventral bristle on the inner side of the hindfemur is short. The longest apical bristle of the second hindtarsal segment reaches a very little beyond the apex of the third segment. The fourth segment of the same tarsus is half as long again as it is broad, and the fifth bears as a rule three lateral plantar bristles on one side and four on the other, the right and left hindtarsi usually differing in these bristles. The proportional lengths of the hindtarsal segments vary slightly, being usually in the ♂ 39, 27, 17, 10, 17, and in the ♀ 44, 28, 18, 10, 18.

*Modified Segments*.—♂. The eighth sternite (text-fig. 27, VIII. st.) is ventrally produced into a rather narrow lobe which is very feebly chitinated, being vitreous from the most distal bristle and membranous at the apex. The segment bears about a dozen bristles, of which the four to six distal ones are long. The process P of the clasper is broad and rounded, being convex dorsally and somewhat incurved ventrally. It bears a transverse row of usually four long bristles, seldom one or two more, the ventral bristle being accompanied by a smaller bristle and the

row running obliquely distad from the dorsal to the ventral margin. The dorsal edge of the process, moreover, bears several thin and short bristles. The movable

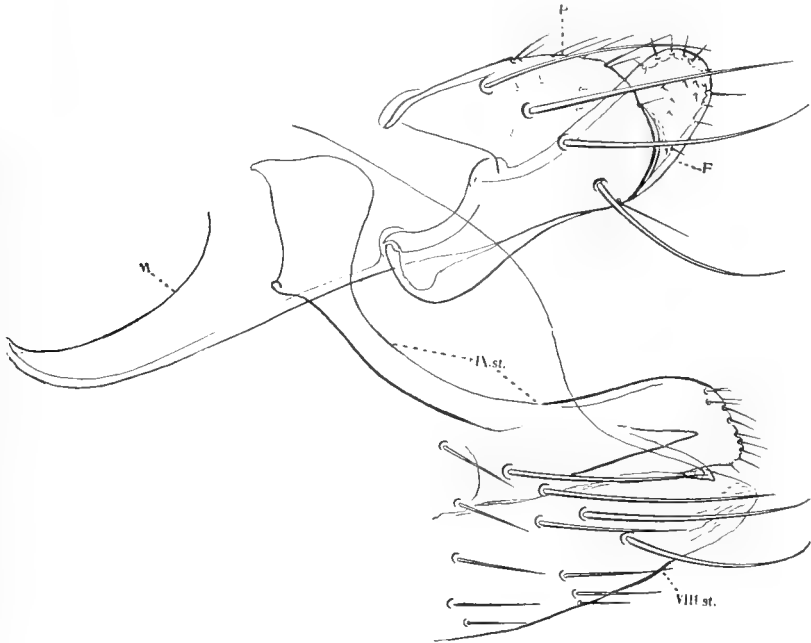


FIG. 27.—*Ctenophthalmus cophurus*.

process F somewhat resembles the sole of a boot. It is narrowest proximally to the centre and has the apex rounded, the ventral edge being more strongly curved than

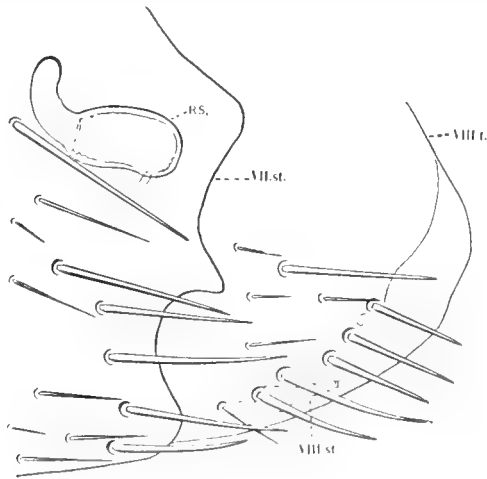


FIG. 28.—*Ctenophthalmus cophurus*.

the dorsal edge. The finger has no long bristles, but only short ones, as shown in the figure. The ninth sternite (IX. st.) is also characteristic in shape. The apex of

the internal vertical arm is very broad, the arm itself slender, and the horizontal arm again broad. This latter portion of the boomerang-shaped segment is not acuminate, as in the allied species, but truncate, with the upper angle rounded and the lower angle about  $85^{\circ}$ . The apex is but feebly chitinised, and bears a row of short slender bristles (about a dozen), there being no bristles farther proximally on the sides and along the ventral margin. The segment, moreover, is clothed at the almost membranous apex with exceedingly minute hairs not indicated in the figure. —♀. The seventh sternite (text-fig. 28) has a very broad sinuate upper lobe, the lower angle of which is produced into a narrow process of variable length. The segment bears a row of from five to seven long and strong bristles on each side and six to eight additional bristles in front of the row. The eighth tergite is strongly rounded, and is further characterised by the position of the bristles, none of which are placed at the apical edge. There is a subventral row of five or six bristles on this segment, which are all stout, sometimes with the exception of the first; above this row there is one long and thick bristle and two to four smaller ones. On the inside the segment bears one or two minute bristles. The stylet is three times as long as it is broad at the base. The anal sternite has seven or eight bristles on the two sides together. The head of the receptaculum seminis (R.S.) is somewhat longer than the tail.

Length (mounted specimens): ♂ 2.3 mm., ♀ 2.4—3 mm.

1 ♂ and 3 ♀ ♀ from Igembi Hills, British East Africa, February 15 and 16, 1911, off *Lophuromys zena*.

1 ♂ and 9 ♀ ♀ from Aberdare Mts., British East Africa, February 17–21, 1910, off *Lophuromys zena*;—type.

1 ♂ from Mt. Kinangop, Aberdare Mts., February 27, 1910, off *Dendromys insignis*.

1 ♀ from Mt. Kinangop, February 25, 1910, off *Oenomys bacchante*.

1 ♂ from Mutaragwa, Aberdare Mts., March 13, 1910, off *Graphiurus microtis saturatus*.

1 ♂ and 4 ♀ ♀ from Mutaragwa, March 13, 1910, off *Epimys jacksoni*.

4 ♂ ♂ and 3 ♀ ♀ from Mutaragwa, Aberdare Mts., March 1–14, 1910, off *Lophuromys zena*.

1 ♀ from Mt. Kenia, December 7, 1910, off *Otomys irroratus elgonis*.

3 ♂ ♂ from Mt. Kenia, December 8, 1910, off *Lophuromys zena*.

1 ♀ from Mt. Kenia, December 10, 1910, off *Epimys jacksoni*.

1 ♀ from Mt. Kenia, January 3, 1911, off *Epimys jacksoni*.

2 ♂ ♂ and 3 ♀ ♀ from Mt. Kenia, January 3, 1911, off *Thamnomys spec.*

1 ♀ from Mt. Kenia, December 12, 1911, off *Epimys medicatus*.

1 ♀ from Mt. Kenia, off *Lophuromys zena*.

## 29. *Ctenophthalmus eximius* spec. nov. (text-figs. 29 and 30).

♂ ♀. Allied to *Ct. cophurus*, but at once distinguished from it by the fifth hindtarsal segment bearing only three pairs of lateral bristles (besides an anterior ventral pair), by the ♀ having four antepygial bristles instead of three, and by the modified abdominal segments being different.

*Head*.—The spines of the genal comb are all three sharply pointed. The genal process is broader than in *Ct. cophurus*, being half as broad again as the second genal spine in the ♂, and nearly twice as broad as that spine in the ♀.

*Thorax.*—The mesonotum has a large lateral area bare of bristles, as in *Ct. cophurus*. The proportional lengths of the hindtarsal segments are as follows: ♂ 40, 26, 18, 9, 17; ♀ 43, 29, 19, 9, 17.

*Abdomen.*—The ♂ bears three and the ♀ four antepygidial bristles, of which the second from above is the longest. The bristles on the sternites of segments III to VII are as follows (on the two sides together, the first figure referring to the bristles of the postmedian row)—♂: 6 + 3 or 4, 6 + 3 to 5, 6 + 2 to 4, 6 + 2 to 4, 6 + 2 to 4; ♀: 8 or 9 + 11 or 12, 8 + 7 or 8, 8 + 4, 8 + 4, 11 or 12 + 8 or 9.

*Modified Segments.*—♂. The eighth sternite (text-fig. 29, VIII. st.) is more strongly chitinised apically than in *Ct. cophurus*, and its dorsal margin starts more gradually, moreover being denticulate. The segment bears thirteen to sixteen bristles on the two sides together. The manubrium as well as the non-movable process of the clasper are much shorter than in *Ct. cophurus*, particularly the former. This process (P) is truncate, with the dorsal angle rounded, the lower angle about 90° and the distal margin slightly notched. It bears five slender bristles at the upper

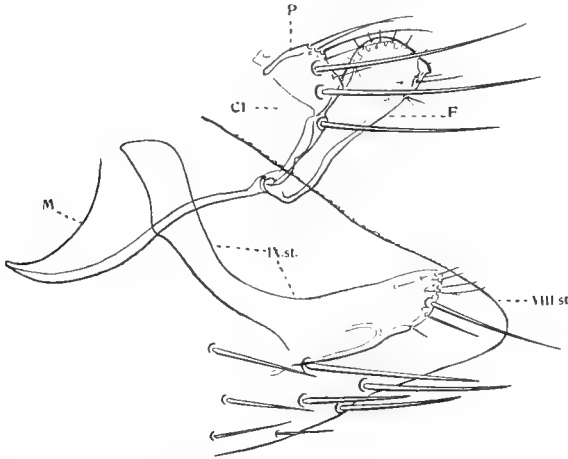


FIG. 29.—*Ctenophthalmus eximus*.

half of the apical margin and an oblique row of three very strong and long bristles on the side, the ventral one being the most proximal. The movable process F is truncate. It almost gradually widens from the insertion to the apex, the ventral angle being distinct and projecting in the shape of a rounded tooth, and the dorsal angle being rounded off. The ventral margin of this exopodite is nearly straight and bears two pairs of small thin bristles in the apical half. The short bristles placed along the apical and dorsal margins, of which there are about eight, are very thin. The inner arm of the ninth sternite is broader than in *Ct. cophurus*, with the exception of the widened apical portion, which is narrower than in that species. The horizontal arm is canoe-shaped distally, being acuminate with the dorsal margin straight and the ventral margin distally rounded. This ventral arm bears about eight small bristles, one long and strong one and behind this bristle a second one half the size (or less) of the long bristle.—♀. The seventh sternite (text-fig. 30) is divided (on each side) by a broad and shallow upper sinus and a smaller, but equally shallow lower sinus into three short lobes, of which the upper one is either pointed or rounded, the second subtriangular with the apex rounded off, and the ventral lobe

quite short. The eighth tergite resembles that of *Ct. cophurus*. It bears a subventral row of five or six stout bristles, sometimes preceded by a small bristle, and above the row there is one long bristle accompanied by one or two small ones. None of the bristles are placed at the apical margin of the segment. On the inner surface the

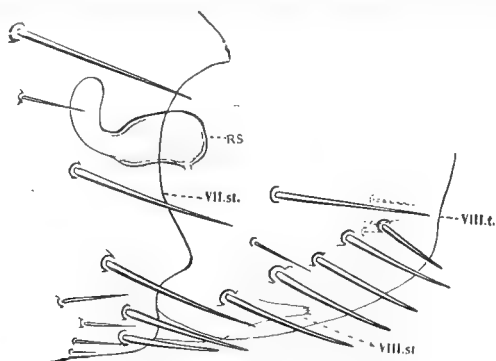


FIG. 30.—*Ctenophthalmus eximius*.

segment bears three to five small bristles. The receptaculum seminis is similar to that of *Ct. cophurus*, but somewhat slenderer than in most examples of that species.

1 ♂ and 1 ♀ from Kigezi, Uganda, April 19, 1911, off *Lophuromys zena*;—type.

1 ♂ and 1 ♀ from Kigezi, April 15, 1911, off *Lophuromys* spec.

1 ♂ from Lake Mutanda, Uganda, May 9, 1911, off *Lophuromys* spec.

2 ♂♂ and 1 ♀ from Nalasanji, Uganda, July 6, 1911, off *Lophuromys* spec.

1 ♂ and 1 ♀ from Chaya, near Ruchuru R., Belgian Congo, September 17, 1911, off *Lophuromys* spec.

2 ♀♀ from Muhamba, Lake Kivu, Belgian Congo, May 20, 1911, off *Lophuromys* spec.

Key to the species of *Ctenophthalmus* known from Africa south of the Sahara.

I. Rostrum reaching to near apex of forecoxa; longest bristle of second hindtarsal segment extending beyond apex of fourth segment; abdominal tergites II. and III. with more than two bristles below the stigma; metepimerum with more than ten bristles; sculpture of surface of body and limbs very inconspicuous.

a. ♂. Movable process of clasper abruptly widened distally, the ventral angle pointing ventrad; ♀ without lateral bristles on the basal abdominal sternite . . . . . *Ct. triodontus* Roths. (1907).

♂. Movable process of clasper not curved down at apex; the ventral angle pointing distad; ♀ with lateral bristles on the basal abdominal sternite . . . . . *Ct. audax* spec. nov.

II. Rostrum hardly extending to apical third of forecoxa; longest bristle of second hindtarsal segment at the most reaching to base of fourth segment; abdominal tergites with only one bristle below stigma; metepimerum with less than nine bristles; metepisternum narrow; surface-sculpture distinct.

b. Fifth hindtarsal segment with four lateral plantar bristles, at least on one side of the segment or in one hindtarsus . . . . . c.

This segment with three lateral plantar bristles. Eighth abdominal segment of ♂ triangular; ♀ with four antepygial bristles. *Ct. eximius* spec. nov.



- c. Mesonotum laterally with only two rows of bristles, there being a large naked area between these rows and the base. IX. st. of ♂ truncate, and VIII. st. apically membranaceous; in ♀ all bristles of VIII. t. at a distance from the edge . . . . . *Ct. cophurus* spec. nov.
- Mesonotum with three rows of bristles and additional small bristles on the sides as well as back, besides the basal row. In ♂ IX. st. acuminate or apically strongly widened; in ♀ the most distal bristle of VIII. st. placed at the apical edge . . . . . *d.*
- d. ♂♂. . . . . *e.*  
 ♀♀. . . . . *i.*
- e. ♂♂. (This sex not known of *Ct. atomus* and *engis*.)  
 IX. st. apically very strongly dilated, the ventral angle being produced into a sharp tooth . . . . . *Ct. lycosius* spec. nov.  
 [and ? *Ct. engis* Roths. (1907)]  
 IX. st. subrotundate at apex, bearing a ventral row of short, stout, strongly chitinised spiniform bristles . . . . . *Ct. acanthurus* spec. nov.  
 IX. st. subacuminate or subtruncate, with long and small bristles, or only with short ones, all slender . . . . . *f.*
- f. Process of clasper divided by a distinct sinus into two lobes . . . . . *g.*  
 Process of clasper not divided . . . . . *Ct. eumeces* spec. nov.
- g. Sinus of process of clasper quite shallow on outer side, movable process more than twice as long as it is broad . . . . . *Ct. ansorgei* Roths. (1907)  
 The sinus deeper, movable process twice as long as it is broad. . . . . *h.*
- h. Apex of movable process much more rounded dorsally than ventrally  
*Ct. cabirus* spec. nov.  
 Apex of movable process almost symmetrically rounded  
*Ct. calceatus* Waterst. (1910)
- i. ♀♀. (This sex not known of *Ct. eumeces*.)  
 Head of receptaculum seminis shorter than tail. . . . . *j.*  
 Head of receptaculum seminis longer than tail. . . . . *k.*
- j. Last bristle of ventral row on VIII. t. half the length of the preceding bristle  
*Ct. engis* Roths. (1907)  
 Last two bristles of that row almost equal in size . . . . . *Ct. lycosius* spec. nov.
- k. No bristles above stigma of VIII. t. . . . . *Ct. acanthurus* spec. nov.  
 One or more bristles above stigma of VIII. t. . . . . *l.*
- l. VII. st. with a narrow and deep sinus  
*Ct. ansorgei* Roths. (1907) and *cabirus* spec. nov.  
 VII. st. with a triangular sinus . . . . . *Ct. calceatus* Waterst. (1912)  
 VII. st. with a very broad upper lobe, lower lobe effaced  
*Ct. atomus* spec. nov.

#### Dinopsyllus gen. nov.

The antennal groove extends to the vertex, as in *Palaeopsylla* Wagn. (1902), to which genus the new one is closely allied. The frontal tubercle is vestigial, being small and rounded, and having in some specimens the appearance of a transparent lid placed on a tunnel; in most examples the tubercle is exceedingly indistinct (text-figs. 33 and 40). There is a vertical row of five spines along the antennal groove, but in one species (*D. ingens*) this comb is reduced to one or two spines, or is absent. The vestigial eye is placed above the row, and

simulates a sixth spine. The genal process is broad and obtuse, and is separated from the oral edge by a deep sinus, which is partly covered by the first and second spines of the genal comb. The antenna is inserted near the vertex in both sexes. Its first segment is very large, being as long as the club and bearing numerous short bristles. The second segment is very short, except on the anterior side, where it is much produced distad. The first segment of the maxillary palpus is longer than, or as long as, the second, and this is about as long as the fourth, or longer, the third being the shortest. The labial palpus consists of five segments.

The pronotum is long and bears two or three rows of bristles, besides a comb of more than twenty-five spines. The thoracic and abdominal tergites are denticulate at the apical margins, particularly the proximal abdominal segments. The pronotum has no comb of spines, while the following four or five abdominal segments (usually with the exception of the first) bear a lateral comb of short, stout spines. The basal abdominal sternite has always a number of small bristles on the sides, the small bristles in front of the postmedian row of long ones of the other sternites are numerous, and the median tergites have at least three rows of bristles. There are three long antepygidial bristles in both sexes, and the eighth tergite has on each side at least eight bristles above the stigma.

The tibiae bear numerous bristles on the outer surface. The outer dorsal bristles form a comb, as in *Leptopsylla*, *Hystrihopsylla*, etc., while four or five inner dorsal bristles are prolonged. The first midtarsal segment is much longer than the second. The fifth segment of the tarsi bears four pairs of lateral ventral bristles (in *ingens* five pairs!), besides an additional pair on the ventral surface near the base.

The modified abdominal segments are very similar in all the species.—In the ♂ the eighth tergite is small and the sternite very large. The ninth tergite is laterally strongly chitinised, a trapeziform plate being formed which bears a row of bristles at the apical margin and two exopodites at the lower distal angle. The upper exopodite (F<sup>1</sup> in our figures) is very long, and reminds one of a sail of a windmill. It is provided with very thin bristles and bears a short, stout, blunt spine at the lower distal corner on the inside. The second process (F<sup>2</sup> in our figures) is quite short. The horizontal arm of the ninth sternite (one on each side) is more or less dilated at the apex and studded along the ventral margin with moderately thick bristles, of which the distal ones are always short and sharply pointed. The anal segment is long, and there is, proximally to the anal sternite, always a very distinct plate, of which the true homology is still obscure (this sclerite is found in many Siphonaptera).—In the ♀ the seventh sternite has a broad and very shallow apical sinus in all the species, varying but little. The eighth sternite is narrow, long, blade-like, with the tip obtuse. The anal segment, especially the sternite, is long, and bears numerous bristles. The stylet is slender, conical. There is one receptaculum seminis, of which the head is about as long as the tail.

Genotype: *D. ellobius* Roths. (1904, as *Ctenopsyllus*).

*Dinopsyllus ingens* is a specialised branch which stands apart from the other species of the genus. But, as we may expect intermediate forms to be discovered, it is not advisable at present to place *ingens* in a separate genus.

*Dinopsyllus* is confined to Africa south of the Sahara, and contains only large species. It is easily distinguished from *Palaeopsylla* Wagn. (1902) and *Leptopsylla* Roths. (1911) by the hairiness of the body, the long first segment of the

antenna, the long pronotum, etc. The species of *Dinopsyllus* differ from *Palaeopsylla* also in some characters which they have in common with *Leptopsylla*—viz. the comb-like dorsal bristles of the tibiae and the long first segment of the midtarsus—and, on the other hand, are distinguished from *Leptopsylla* by the non-angulate frons and the absence of spine-like frontal bristles, besides the previously mentioned differences. The species of *Dinopsyllus* are at first sight very uniform in structure, particularly in the modified abdominal segments, and some of them exhibit obvious differences only in the males; at any rate, we have not been successful in finding the differences in the females of two of the species. The study of *Dinopsyllus*, therefore, presents some difficulties.

Besides the genotype, *D. ellobius*, two other species belonging here have been previously described by the junior author as *Typhlopsylla ingens* and *Ctenopsyllus hirsutus*. The description of *ellobius* was based on a single pair and that of *hirsutus* on one female, all in but moderate state of preservation. As we now have a number of species with which we can compare *ellobius* and *hirsutus*, it appears desirable to point out the main characteristics in which each known species differs from its congeners. For that reason we propose to enumerate here all the species of *Dinopsyllus* with which we are acquainted, whether they were obtained by Mr. Kemp or some other collector. The genus is evidently one of the chief features of the Ethiopian fauna of Siphonaptera.

The collection made by Mr. Kemp contains no less than eight species, all being new to science.

### 30. *Dinopsyllus echinus* spec. nov. (text-figs. 31 and 32).

♂ ♀. The largest species found by Mr. Kemp. It is at once recognised by the peculiar structure of the derm. The raised lines of the exoskeleton form a network of rather small and in many places almost regular meshes, generally hexagonal. On the sides, however, the transverse connections are so thin that the reticulation appears to be replaced by dorso-ventral lines only connected irregularly. These lines have the appearance of being densely though minutely denticulated, which is not the case in any other species known to us. The denticulation is quite distinct even in unmounted specimens. The teeth are the proximal portions of the transverse lines, of which the distal portions are not visible in transmitted light. The species greatly resembles in size and general appearance *D. hirsutus* Roths. (1908).

*Head*.—The frons is evenly rounded in the ♂ and inclines very little backwards, being broad ventrally, the distance of the frontal oral corner to the tip of the lowest genal spine being larger than the distance from that corner to the vestigial frontal tubercle. The latter is situated below the centre of the frons. The genal process measured from the tip of the second genal spine is as long as this spine measured from the tip of the third spine. The bristles of the head are essentially the same as in other species of this genus. The maxillary palpus is characterised by the second segment being longer than usual, the measurements, which vary to a slight extent, being: ♂ 24, 22, 15, 19; ♀ 25, 25, 15, 22.

*Thorax*.—The pronotum has a comb of thirty-five to thirty-eight spines and three rows of bristles, of which the anterior row is incomplete. The mesonotum bears dorsally seven to eight rows of bristles, and has, as in other species, a couple of setiform spines near the apex internally on both sides. The metanotum bears only five rows of bristles. The metepimerum has from thirty-five to fifty bristles.

*Abdomen*.—The basal abdominal sternite has seven bristles in the ♂ and from

twenty-three to thirty-five in the ♀. The central segments bear dorsally five rows of bristles. Most specimens are provided with four combs of spines on segments II-V, the ♂♂ sometimes (*e.g.* in the type-specimen) bearing a spine at the apex of the segment I. The numbers of spines in the combs are as follows : II 7-9, III 8-12, IV 8-13, V 0-4.

*Legs.*—These agree with the legs of the other species of the genus.

*Modified Segments.*—♂. The ventral angle of the eighth sternite (text-fig. 31) is

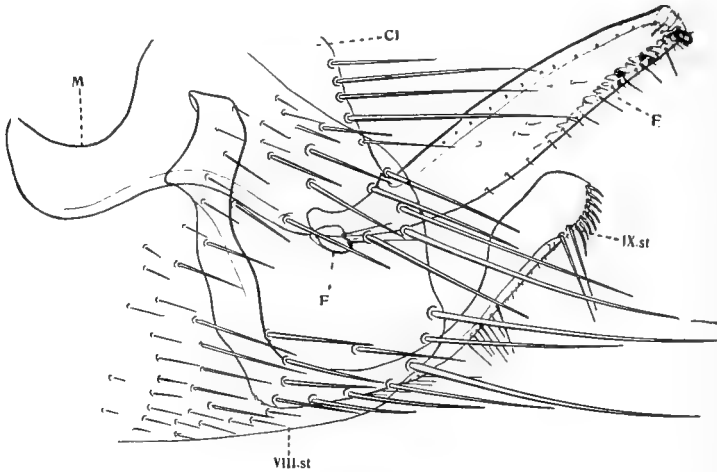


FIG. 31.—*Dinopsyllus echinus*.

rounded off and bears two bristles, the interspace between which either nearly equals, or is almost twice as wide as, the groove of the upper bristle, which is the larger

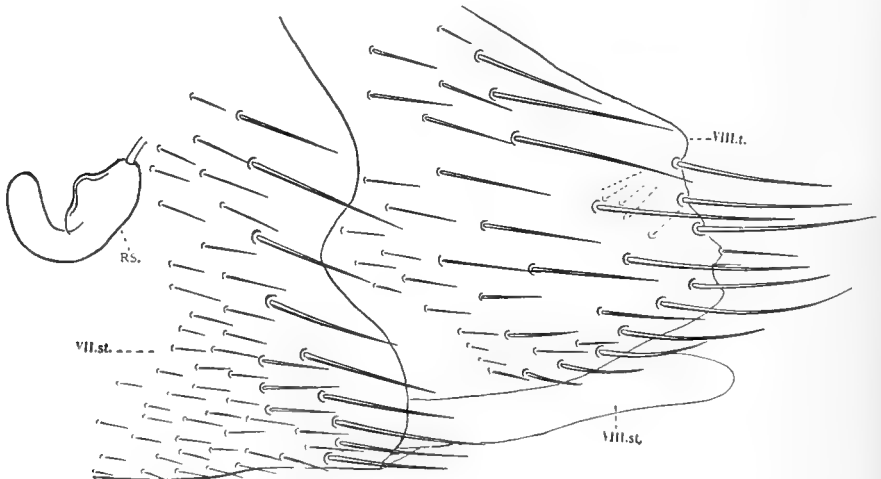


FIG. 32.—*Dinopsyllus echinus*.

of the pair. The long process of the clasper is slightly more convex on the upper side than on the lower, and is widest proximally to the centre. Its upper margin

is three and a half times as long as the largest transverse diameter of this process. The ninth sternite bears three sets of bristles on the ventral side, an apical row of nine or ten, of which the last two are long, a median row of seven or eight, and a number of thin bristles situated along the proximal half of the segment. The dilated apex of the ninth sternite is dorsally flattened.—♀. The seventh sternite (text-fig. 32) is rather deeply sinuate. The distance of the long subapical bristles of this sternite from the bottom of the sinus equals at the most the distance between four bristles of the last row of the seventh tergite. The eighth tergite nearly always bears four bristles above the apical sinus and, as in the other species, a thin one in the sinus, one example having three instead of four bristles.

Length (mounted specimens): ♂ 4.5 mm., ♀ 4.5 to 5.7 mm.

1 ♂ and 2 ♀ ♀ from Mutaragwa, March 7, 1910, off *Epimys jacksoni*.

1 ♂ from Mt. Kenia, December 5, 1910, off *Lophuromys zena*.

1 ♂ and 1 ♀ from Igembi Hills, N.E. of Mt. Kenia, British East Africa, February 15, 1911, off *Epimys* spec.

2 ♂♂ and 3 ♀♀ from Mutaragwa, Aberdare Mts., Brit. E. Africa, March 1-14, 1911, off *Lophuromys zena*.

2 ♀♀ from Muhamba, Lake Kivu, March 20, 1911, off *Lophuromys zena*.

1 ♀ from Kidaha, Mutanda, Uganda, off *Lophuromys* spec.

1 ♀ from Kigezi, Uganda, April 12, 1911, off *Arvicanthus abyssinicus rubescens*.

### 31. *Dinopsyllus hirsutus* Roths. (1908).

*Ctenopsyllus hirsutus* Rothschild, *Ent. Mo. Mag.* (2) xix. p. 78. no. 4. tab. 1. fig. 4 (1908) (Ruwenzori).

Described from a single ♀ obtained on *Mus univittatus lunaris*. This specimen agrees closely with the females of the preceding species, but the differences are such that they would not justify us in treating *hirsutus* and *echinus* as being the same insect.

♀. *D. hirsutus* shares with *D. echinus* the dense reticulation of the body, the long second segment of the maxillary palpus, the shape of the outline of the head, and the size, but is distinguished by the following characters. The denticulate appearance of the sides of the abdomen is absent from *D. hirsutus*, the metepimerum bears only 27 (24)\* bristles, and the combs of the abdomen contain very few spines, the numbers being 5, 3, 2, 0 (4, 3, 2, 0). Moreover, the seventh tergite is abruptly dilated below the antepygidial bristles into an almost rectangular lobe, the corresponding lobe of *D. echinus* being much more rounded and projecting much less. The distance of the long bristle nearest to the base of the sinus of the seventh sternite is much larger than in *D. echinus*, equalling the distance between six bristles of the subapical row of the seventh tergite. The eighth tergite bears three bristles at the apical margin above the sinus, the upper bristle being much stouter and shorter than the second. The basal abdominal sternite bears 16 (17) bristles on the side in *D. hirsutus*, and 22 to 35 in the ♀ of *D. echinus*.

Mr. Kemp did not meet with this species.

In the species now following the surface of the body does not bear a distinct reticulation except in a few restricted places—e.g. on the abdominal sternites in between the bristles—whereas the vertical lines are very obvious. There are few transverse connections between these lines. The difference between the preceding

\* The numbers in brackets refer to the other side of the body.

species and the following ones is even more pronounced in reflected light than in transparent light, the whole body of *D. echinus* and *hirsutus* having the appearance of being densely covered with an armour of small scales, while in the following species only the dorso-ventral lines are visible.

An imitation of small teeth occurs in all the following species in the apical area of the abdominal sternites, and is observed, as may incidentally be mentioned, in many other Siphonaptera, e.g. *Leptopsylla*.

32. *Dinopsyllus longifrons* spec. nov. (text-figs. 33 and 34).

♂ ♀. On an average larger than the following species, but smaller than the previous ones. The frons is longer in the ♂ than in any other known species, with the exception of the one from Angola described as No. 39 of this paper. The pronotum, as a rule, has three rows of bristles in both sexes, the abdominal bristles are very numerous, in the ♀ particularly on the basal sternite and eighth tergite, and the ♂ has usually a comb on the first abdominal tergite.

*Head.*—The frons, in the ♂, is very strongly curved (text-fig. 33) in the region of the frontal tubercle and almost straight farther down, the outline being nearly

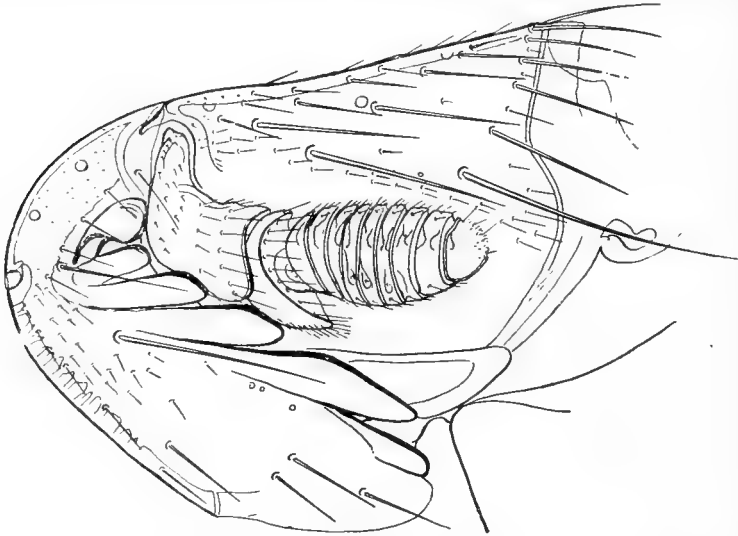


FIG. 33.—*Dinopsyllus longifrons*.

parallel with the row of genal spines. The vestigial frontal tubercle is situated at two-thirds in the ♂ and in the centre or a little below it in the ♀. The distance of the tip of the first genal spine from the frontal oral corner is less than half the length of the frons. There is a row of five or six bristles above the vestigial eye, one longer bristle immediately below this row, and a long one farther down at some distance in front of the third genal spine (counted from below). Numerous small bristles varying in number are placed on the frons from the vestigial frontal tubercle downwards, besides five or six medium-sized ones, which are situated at and near the frontal and genal edges. The occiput bears three rows of bristles, the last row containing fifteen or sixteen on the two sides together. The proportional lengths of the segments of the maxillary palpus are 21-22, 15-17, 11-12, 16-17. The head of the ♀ agrees with that of the ♂, except in the frons being much shorter, more

evenly rounded and broader. The short bristles found above the antennal groove and on the first segment of the antenna are more numerous in the ♀ than in the ♂, the ♀-antenna, in addition, being much shorter.

*Thorax.*—The pronotum has a comb of 27–29 spines in the ♂ and 29–31 in the ♀, and bears in most specimens three rows of bristles, containing in the ♂ 9–11, 16–19 and 14 bristles respectively, the numbers being in the ♀ 0–3, 18–19, 13–14. The mesonotum has seven rows of bristles, the anterior rows being irregular and incomplete; the metanotum has six rows, of which the first is represented by a few bristles only. The mesopleura bear in the ♂ 27–30 bristles and in the ♀ 34–50, the metepimerum having at least twenty-nine in both sexes.

*Abdomen.*—In most ♂♂ the first abdominal tergite bears a comb of a few spines, but apparently never in the ♀. The second to fifth tergites have a lateral comb in the ♂ and the second to fourth in the ♀, the sixth of the ♂ and fifth of the ♀ bearing occasionally a single spine. The numbers of spines in the combs on each side are: ♂—I 0–4, II 8–11, III 8–13, IV 11–15, V 6–9, VI 0–1, and in the ♀ I 0, II 4–6, III 5–7, IV 3–7, V 0–1. The tergites I–VII bear each four rows of bristles with a few additional small bristles in front. The bristles of the tergites are more numerous in the ♂ than in the ♀. The basal sternite has ten to fourteen small lateral bristles in the ♂ and seventeen to twenty-three in the ♀, besides a number of bristles placed at the ventral margin. The posterior row on the sternites of segments III–VI contains on the two sides together eight to eleven long bristles in both sexes, there being twenty-five to forty-five bristles in front of the row.

*Legs.*—The forecoxa has about a hundred bristles on the outer surface and the margins, and the forefemur about ten to fifteen small lateral bristles on the outside in the ♂ and sixteen to twenty-two in the ♀. The mid- and hindfemora have lateral bristles only at and near the apex. The comb-like dorsal bristles of the foretibia number eleven or twelve, while those of the hindtibia vary from fifteen to nineteen. Each tibia bears four long inner dorsal bristles, the corresponding bristle of the first notch on the foretibia also being prolonged. The bristles of the tarsi are short but very numerous. Many of the additional lateral bristles are rather pale, such bristles being particularly numerous on the anterior side of the second hindtarsal segment. The measurements of the tarsi are as follows in two pairs:

Foretarsus :	♂—17, 15, 11, 8, 16 ;	♀—21, 15, 11, 8, 18.
	19, 16, 11, 8, 17 ;	21, 15, 11, 8, 18.
Midtarsus :	♂—29, 20, 12, 9, 20 ;	♀—37, 23, 14, 9, 18.
	35, 25, 15, 10, 20 ;	38, 24, 14, 9, 18.
Hindtarsus :	♂—55, 41, 24, 13, 20 ;	♀—65, 42, 23, 14, 19.
	64, 44, 25, 15, 21 ;	63, 45, 24, 15, 22.

*Modified Segments.*—♂. The eighth tergite (text-fig. 34) bears about a dozen short bristles above the stigma on each side. The eighth sternite has the apical margin slightly incurved; the lower angle projecting a little, though it is strongly rounded off. The bristles number about fifty-five to sixty, and are divided by a naked apical area into an upper and a lower set, as shown in the figure. The ninth tergite bears a row of hairs below the sensory plate and four large bristles at the apical margin of the lateral incassate portion which corresponds to the clasper of other Siphonaptera, these long bristles being accompanied by one or two small ones. The long process  $I^1$  is more strongly widened in the centre than in the other known

species of *Dinopsyllus*, and its upper apical angle projects distinctly. The bristles of the ninth sternite, though somewhat variable, exhibit a common plan of arrangement in all the specimens. There is an apical series of seven to nine, of which the two posterior bristles—occasionally separated by a short one—are long. In a proximal direction several minute hairs follow, then a solitary long bristle, and one or more minute hairs, and finally a row of small and moderately long bristles (text-fig. 34).—♀. The seventh sternite has nearly the same outline in all the species, the apical margin bearing a broad and shallow sinus. This sclerite has in *longifrons* a postmedian row of from fifteen to nineteen long bristles on the two sides together, there being from forty-seven to over sixty smaller bristles in front of the row. The eighth tergite bears about fifty bristles below the stigma and about twenty above it, on each side. The apical margin of this tergite is sinuate above the ventral angle, which is pointed, a thin bristle being placed in the sinus and three

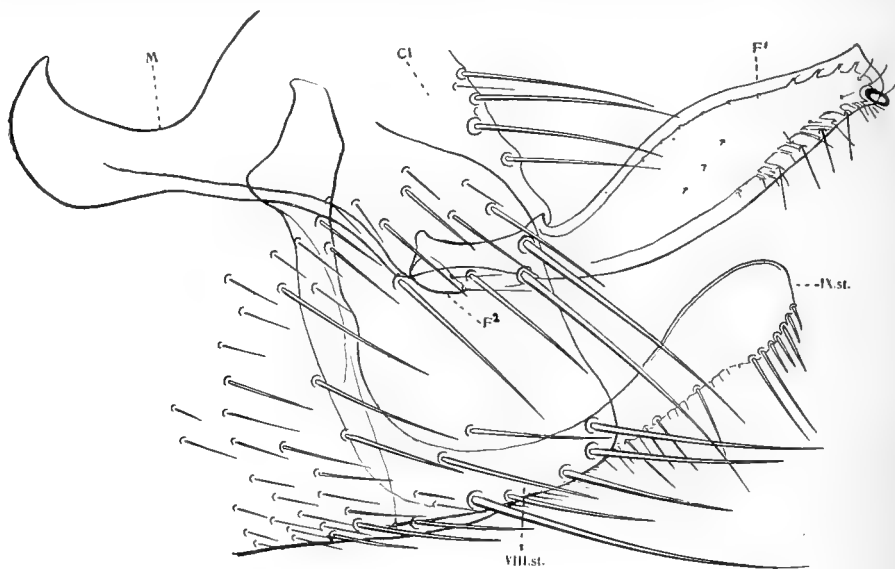


FIG. 34.—*Dinopsyllus longifrons*.

larger ones above it. There is an oblique subapical row of four bristles on the inner surface of the eighth tergite. The receptaculum seminis has a hump on the upper side of the head.

Length (mounted specimens) : ♂ 3.5–4 mm. ; ♀ 4.3–5.2 mm.

2 ♂♂ and 1 ♀ from Aberdare Mts., British East Africa, February 13, 1910, off *Tachyoryctes audax* ;—type.

1 ♀ from Mt. Kinangop, Aberdare, February 24, 1910, *Otomys irroratus elgonis*.

2 ♀♀ from Rumruti, British East Africa, October 31, 1910, off *Thamnomys* spec.

1 ♂ from Rumruti, British East Africa, October 28, 1910.

1 ♀ from Nakura, British East Africa, September 21, 1910, off *Arvicanthis abyssinicus rubescens*.

1 ♂ from Mt. Kenia, British East Africa, December 18, 1910, off *Epimys* spec.

1 ♂ from Kigezi, Uganda, April 28, 1911, of *Lophuromys* spec.

1 ♀ from Nalasanji, Uganda, July 8, 1911, off *Lophuromys* spec.



- 1 ♀ from Mbarara, Uganda, July 30, 1911, off *Oenomys* spec.  
 1 ♂ and 1 ♀ from Mt. Kenia, off *Epimys* spec.  
 1 ♀ from Kiduhu, Uganda, off *Lophuromys* spec.  
 2 ♀ ♀ from Kigezi, Uganda, April 27, 1911.  
 1 ♀ from Kigezi, April 12, 1911, off *Arvicanthis abyssinicus rubescens*.  
 1 ♀ from Chaya, Belgian Congo, June 17, 1911, off the same host.

33. *Dinopsyllus apistus* spec. nov. (text-fig. 35).

This species and the next are easily distinguished in the ♂♂, but the ♀♀ do not seem to present any reliable differences, provided that the specimens which we presume to be the females of *apistus* belong to this species and not to the next.

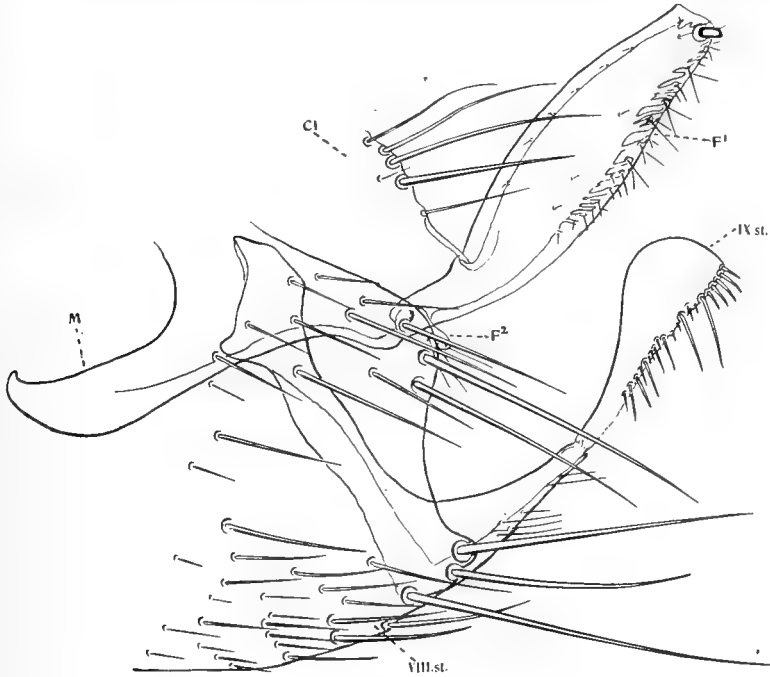


FIG. 35.—*Dinopsyllus apistus*.

*D. apistus* and all the following species are so closely allied to *D. longifrons* that most of the characters mentioned in the above description of that species apply equally well to these other species. For the sake of brevity we shall therefore endeavour to avoid repetition, and confine the descriptions of the following species as much as possible to the main distinguishing characters. With the exception of the last species (from Angola) the thorax and abdomen bear less bristles than in *D. longifrons*, the spines in the abdominal combs are less numerous, the ♂♂ have no comb on the first abdominal tergite the eighth abdominal tergite of the ♀♀ has less than forty bristles below the stigma, the frons of the ♂♂ is shorter, and their clasp ing organs exhibit some distinctions in shape and in the number and position of the bristles.

♂. *D. apistus* ♂ is recognised by the apical ventral angle of the eighth

sternite being produced and bearing two long bristles placed close together (text-fig. 35). The process  $F^1$  of the clasper, moreover, is a little less widened in the centre than in *D. longifrons*. The ninth sternite (IX. st.) is strongly rounded dorsally at the apex and very slender in the centre. It bears about six small and slender bristles in the proximal two-fifths, no bristles in the central fifth, and a slightly variable comb of stiff bristles in the apical third, either two (type) or three of the bristles of this comb being as long as the sclerite is broad at the widest point of the dilated apex.

The distances of the oral frontal corner from the tip of the ventral spine of the genal comb on the one hand and from the centre of the vestigial frontal tubercle on the other are 66 and 100 respectively. The mesonotum has six rows of bristles (the anterior rows being irregular) and the metanotum five or six rows. The mesopleura bear sixteen to eighteen bristles, the metepimerum nineteen to twenty-two, the first abdominal sternite five to seven, the seventh sternite (on the two sides together) a row of eight, and seventeen to twenty additional smaller bristles, and the eighth sternite about forty-two bristles. One of the specimens has only one apical spine on each of the abdominal segments II, III, and IV, while other examples have several spines—*e.g.* the type bears on one side 3, 3, 4, 1 spines, and on the other 2, 3, 5, 1.

One of the ♂♂ (see below) is accompanied by two ♀♀; these three specimens, being taken off the same individual of the host, are, presumably, one species. The two ♀♀ agree in most details with one another, but do not present any marked difference from ♀♀ obtained in other localities and on other hosts, and belonging to some other species—*e.g.* *D. lypus*. The number of bristles on some of the segments are as follows: The mesopleura have seventeen or nineteen bristles, the metepimerum twenty-four or twenty-five, the first abdominal sternite fifteen or sixteen, the seventh tergite a row of twelve and twenty small additional bristles on the two sides together in both specimens, the seventh sternite a row of sixteen and forty-six additional bristles, also in both examples, and the eighth tergite twenty-nine or thirty-five bristles below the stigma. There are three abdominal combs, consisting of 3, 4, 4 and 3, 4, 5 spines.

Length (mounted specimens): ♂ 3—3.5 mm.; ♀ 3.5 mm.

1 ♂ and 2 ♀♀ from Mt. Kenia, British East Africa, December 25, 1910.

1 ♂ from Mt. Kenia, British East Africa, December 13, 1910, off *Epimys jacksoni*.

1 ♂ from Mt. Kenia, British East Africa, January 2, 1911, off the same host.

1 ♂ from Kigezi, Uganda, April 28, 1911, off *Lophuromys* spec.;—type.

1 ♂ from Mt. Kenia, British East Africa, January 3, 1911, off *Heliosciurus keniae*.

#### 34. *Dinopsyllus lypus* spec. nov. (text-figs. 36 and 37).

Evidently the commonest species of the genus in British East Africa and Uganda.

♂. The ventral apical angle of the eighth abdominal sternite (text-fig. 36) is strongly rounded off, not being produced as in *D. apistus*, and bears two bristles, the space between which is about twice as wide as the groove of a bristle. Proximally to these bristles there is a very long one, as shown in the figure. The number of bristles on the eighth sternite is sixty odd (on each side). The process  $F^1$  of the clasper is practically the same as in *D. apistus*, but the ninth sternite is characterised by bearing an apical row of eight bristles, of which the posterior three are long, a median row of five to eight, and a few thin proximal bristles.

The type-specimen has twenty-seven bristles on the mesopleura, twenty-five on the metepimerum on one side and twenty-nine on the other, thirteen small ones on the

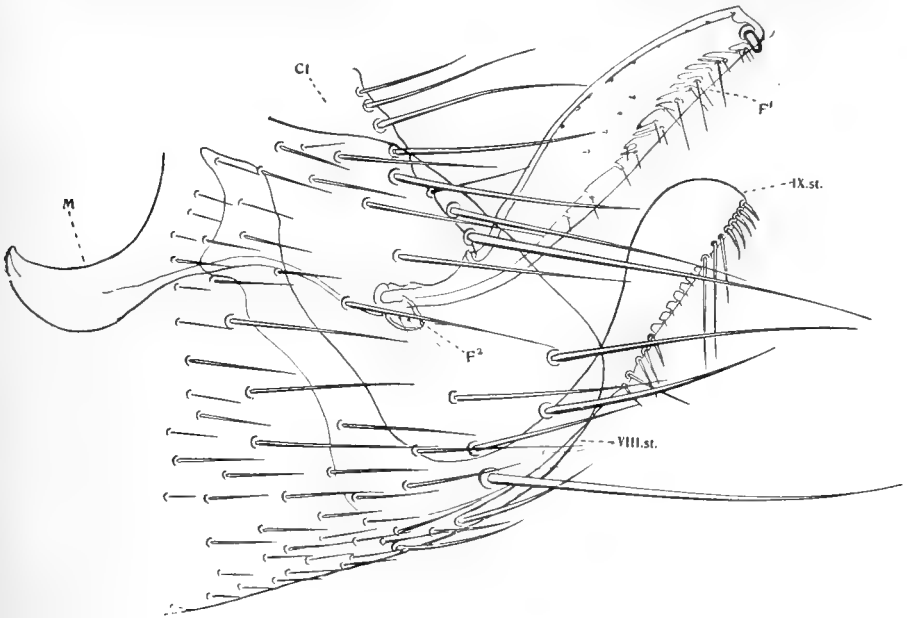


FIG. 36.—*Dinopsyllus lypus*.

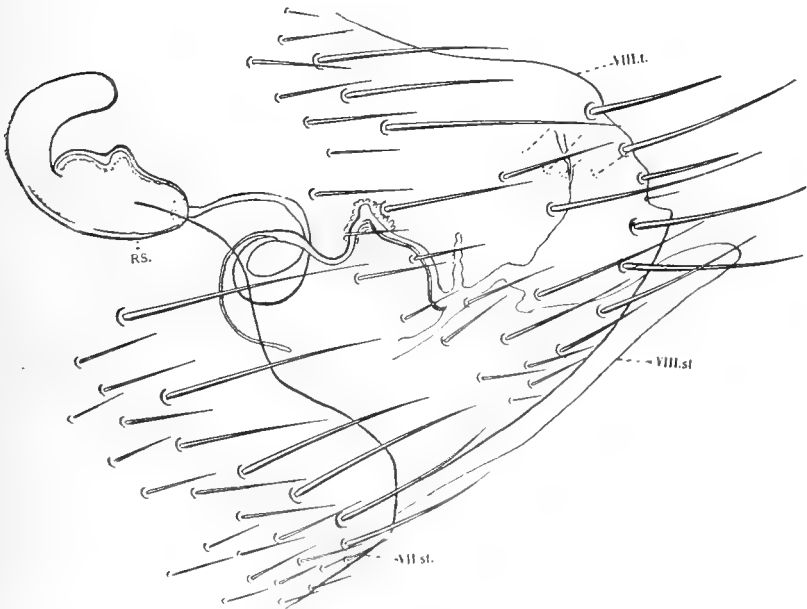


FIG. 37.—*Dinopsyllus lypus*.

the basal sternite, and four abdominal combs consisting of 4, 5, 7 and 1 spines on one side and 4, 7, 6 and 2 on the other.

Some specimens which we consider as belonging to this species have a vestigial third row of bristles on the pronotum. A series of five ♂♂ (and four ♀♀) taken off *Epimys medicatus* at Nairobi, moreover, proves the bristles on the ninth sternite of the ♂ to be variable in number, particularly the median series. The numbers of teeth in the abdominal combs of these five ♂♂ are as follows (one side only counted): 4, 5, 7, 5—4, 4, 4, 1—3, 5, 5, 0—4, 6, 5, 3—4, 5, 4, 2.

Length (mounted specimens): ♂ 3·3—4 mm.; ♀ 3·4—4·3 mm.

1 ♂ and 2 ♀♀ from Rumruti, British East Africa, October 31, 1910, off *Nasilio delamerei*.

3 ♂♂ from Rumruti, October 26 and November 8, 1910, off *Epimys medicatus*.

2 ♀♀ from Rumruti, October 27 and 28, 1911, off *Arvicanthus massaicus*.

1 ♂ and 2 ♀♀ from Rombo, Kilimanjaro, June 7 and 21, 1910, off *Arvicanthus ardens*.

1 ♀ from Mutaragwa, Aberdare Mts., March 1 and 14, 1910, off *Lophuromys zena*.

2 ♀♀ from Nairobi, British East Africa, September 16, 1910, off *Arvicanthus* spec.

2 ♀♀ from Nairobi, September 12, 1910, off *Otomys* spec.

1 ♀ from Nairobi, September 13, 1910, off *Arvicanthus* spec.

5 ♂♂ and 4 ♀♀ from Nairobi, September 12, 1910, off *Epimys medicatus*.

2 ♀♀ from Nakura, British East Africa, September 20, 1910, off *Epimys* spec.

1 ♀ from Naivasha, British East Africa, September 17, 1910, off *Epimys* spec.

1 ♀ from Igembi Hills, British East Africa, February 15, 1911, off *Otomys* spec.

2 ♀♀ from Masaka, Uganda, March 27, 1911, off *Arvicanthus abyssinicus rubescens*.

1 ♂ from Masaka, Uganda, July 31, 1911, off *Otomys* spec.

1 ♂ from Kigezi, Uganda, April 2, 1911, off *Arvicanthus abyssinicus rubescens*.

2 ♂♂ and 7 ♀♀ from Mbarara, Uganda, April 3, 1911, off *Oenomys* spec.

1 ♀ from Mbarara, Uganda, July 28, 1911, off *Oenomys* spec.

1 ♀ from Kagambah, Uganda, July 10, 1911, off *Epimys walambae pedester*.

1 ♀ from Kagambah, July 14, 1911, off *Lophuromys* spec.

1 ♀ from Kagambah, July 14, 1911, off *Dasymys medius*.

1 ♂ and 1 ♀ from Nalasanji, Uganda, July 8, 1911, off *Lophuromys ansorgei*.

### 35. *Dinopsyllus grypurus* spec. nov. (text-fig. 38).

♂. Similar to *D. lypusus*, but abundantly distinct in the clasping organs. The eighth abdominal segment is as in *D. lypusus*. The two bristles which are placed near the ventral apical angle are sometimes close together, occasionally (e.g. in the type-specimen) the space between them is about twice as wide as the groove of a bristle. The long process F<sup>1</sup> of the clasper is of nearly even width throughout and, in contradistinction to all the other species, is bent upwards. The apex of the ninth sternite (text-fig. 38) is more rounded ventrally than in the other forms, and the short bristles placed there are straight and thin, at any rate thinner than in the other species. The number of bristles on the ninth sternite is not constant, being different to some extent even on the right and left halves of the sternite. There is an apical set of from five to eight, of which two or only one is long, then follows (proximad) a gap with minute bristles, sometimes interrupted by a single moderately long one (as in fig. 38), and then

a set of three or four, of which one is somewhat prolonged, there being also some additional minute bristles at the ventral edge farther proximally.

The frons is a trifle longer than in *D. lypusus*. The meso- and metanota bear five rows of bristles, the former having a few additional bristles dorsally near the base. The mesopleura are studded with eighteen bristles, the metepimerum with twenty-one to twenty-four, and the first abdominal sternite with three to nine. The abdominal combs consist of the following spines in the three mounted specimens,

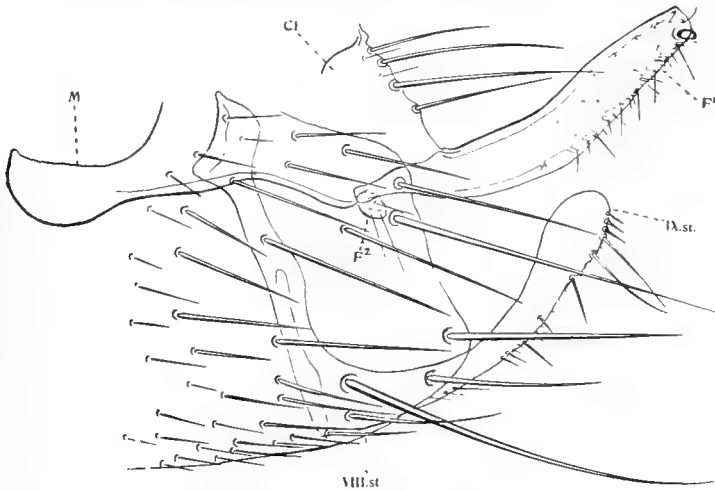


FIG. 38.—*Dinopsyllus gryppurus*.

the figures in brackets referring to the combs of the other side of the same specimen : 3, 2, 4 (2, 6, 5)—4, 4, 4 (4, 4, 4)—3, 4, 6 (5, 3, 4).

Length (mounted specimens) : ♂ 3.0–3.5 mm.

4 ♂♂ from Mutaragwa, Aberdare Mts., British East Africa, March 24, 1910, off *Dendromys nigrifrons* ;—type.

1 ♂ from Mt. Kinangop, Aberdare Mts., March 1, 1910, off *Crocidura fumosa*.

### 36. *Dinopsyllus eremus* spec. nov. (text-fig. 39).

♀. Two females obtained by Mr. Kemp in Belgian Congo and one in British East Africa differ so much in the receptaculum seminis from all other females that we have no doubt of their specific distinctness. In all the females, inclusive of *D. echinus* and *hirsutus*, the receptaculum has a prominent hump on the upper side of the “head,” and apparently does not present any differences in the various species. On the other hand, the receptaculum seminis of *D. eremus* has no hump whatever (text-fig. 39).

The specimen, moreover, is distinguished from *D. lypusus* and *apistus* by the slightly different position of the vestigial frontal tubercle. In the two species mentioned the tubercle is situated in the ♀, a little nearer to the frontal oral corner than to the hind edge of the frons, while in *D. eremus* the reverse is the case. The occiput measured along the dorsal line is twice as long as the distance of the antennal groove (on the vertex) to the frontal tubercle in *D. eremus*, and only about half as long again as that distance in *D. lypusus* and *apistus*. The

pronotum is longer than in the species mentioned, particularly the comb, which contains thirty-five spines. The mesopleura bear 20 (19) bristles, the metepimerum has 26 (25), the basal abdominal sternite 13 (13), the seventh tergite on the two sides together a row of nine long bristles, and in front of the row twenty-one additional bristles, the numbers on the seventh sternite being thirteen and forty-eight, and the eighth tergite has on each side six bristles above the stigma and thirty-one to thirty-seven below it. The three combs of the abdomen contain 4, 4, 6 (4, 2, 6) spines. The numbers in brackets refer to the other side. The stylet is half as long again as in *D. apistus* and *lypusus*, being as long as in the much larger *D. hirsutus* and equalling twice the distance between the first and second bristles of the posterior

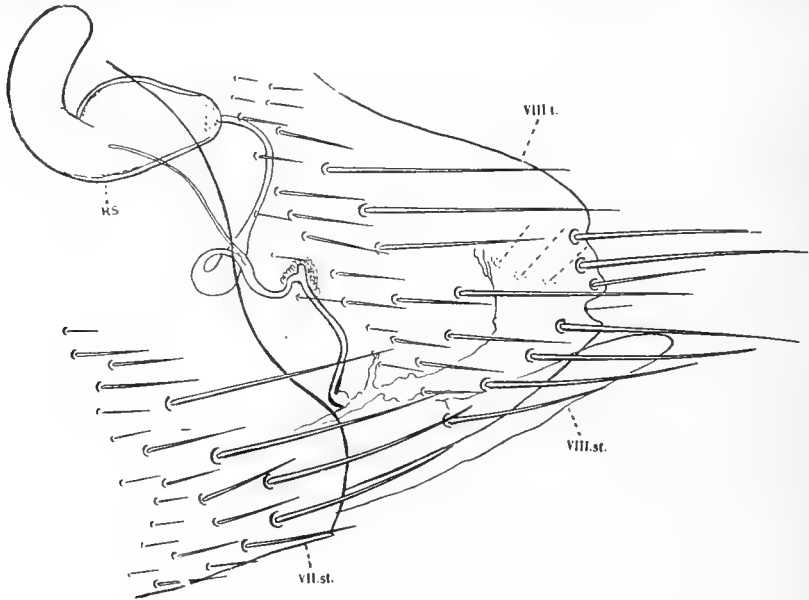


FIG. 39.—*Dinopsyllus eremus*.

row on the sixth tergite. The apical margin of the seventh sternite is more oblique than in the allied species, the sinus being shallow and the upper lobe less prominent.

Length (mounted specimen): 3.8 mm.

1 ♀ from Mt. Mikeno, Belgian Congo, off *Lophuromys* spec. ;—type.

1 ♀ from Buhamba, near Lake Kivu, Belgian Congo, June 1, 1911.

1 ♀ from Igembi Hills, British East Africa, February 13, 1911, off *Thamnomys* spec.

### 37. *Dinopsyllus kemp* spec. nov. (text-fig. 40).

♂. A single specimen of *Dinopsyllus* was found by Mr. Kemp on *Graphiurus microtus saturatus*. This example, though closely agreeing with *D. lypusus* in other respects, is remarkable for its short round frons, which is more like that of a *lypusus* ♀ than a ♂. In this character *D. kemp* comes very near to *D. ellobius* Roths. (1904). The vestigial tubercle is exactly in the centre of the frons (text-fig. 40). The genal process is longer and broader than in *D. apistus*, *lypusus*, and *ellobius*, and the second genal spine (counted from below) slenderer.

The pronotum has a comb of thirty-one spines and bears two rows of bristles. The mesopleura have 20 (21) bristles, the metepimerum bears 17 (18), the basal abdominal sternite 8 (6), and the eighth sternite 36 (38). There are four combs on the abdomen on segments II to V, the numbers of teeth being 7, 8, 8, 8 (7, 9, 10, 5). The seventh tergite bears a row of eighteen long bristles, and only eleven

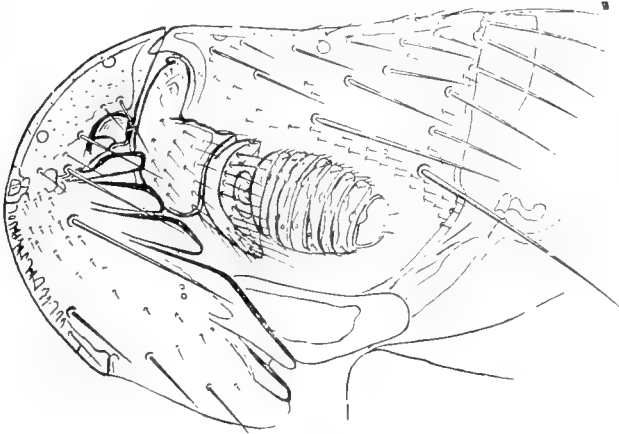


FIG. 40.—*Dinopsyllus kempi*.

additional bristles in front of the row on the two sides together, the numbers on the seventh sternite being eight and twenty-four respectively.

The apical ventral angle of the eighth sternite is less rounded than in *D. lypusus*, but more so than in *D. apistus*, and the two long bristles placed near this angle are farther apart from each other than in the allied species. The ninth sternite bears an apical row of eight bristles, of which two or three are long, then follow two moderately long bristles and farther proximally a row of four or five bristles.

Length (mounted specimen) 3.6 mm.

1 ♂ from Mntaragwa, Aberdare Mts., British East Africa, March 13, 1910, off *Graphiurus microtus saturatus*.

### 38. *Dinopsyllus ellobius* Roths. (1905).

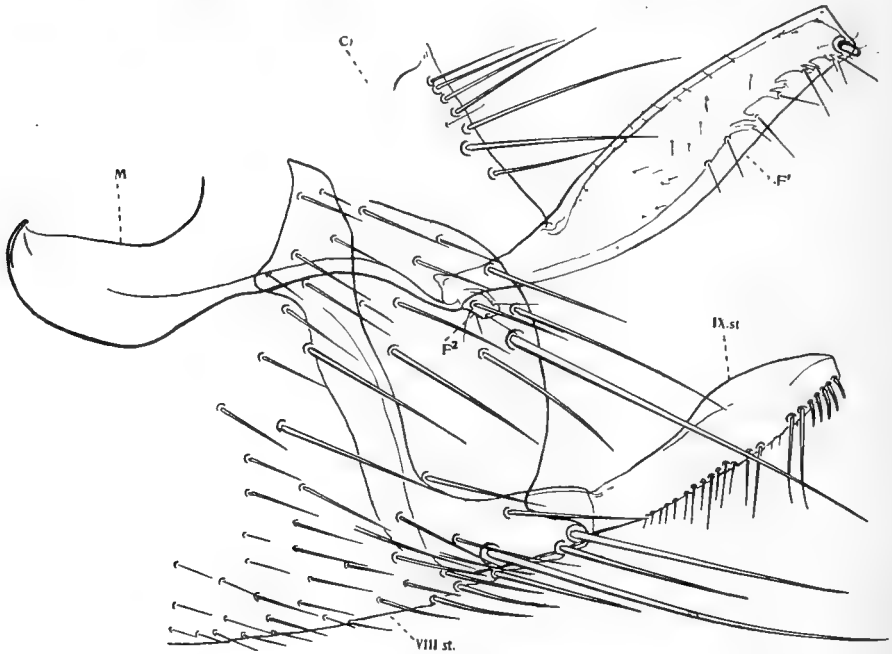
*Ctenopsyllus ellobius* Rothschild, *Nor. Zool.* xii. p. 490. no. 9. t. 14. fig. 13-15 (1905) (Zululand).

The frons is short and ventrally very broad, the head agreeing best with that of *D. kempi*. The distance between the tip of the lowest genal spine and the frontal oral corner is larger than (♂) or as large as (♀) that between the frontal oral corner and the vestigial frontal tubercle. This tubercle is placed **below** the centre of the frons in both sexes. The eighth sternite of the ♂ is strongly rounded off apically, and the two bristles placed near its ventral apical corner (which is quite effaced) are quite close together.

We take the opportunity of also describing the following species from Angola collected by Dr. Ausorge.

39. *Dinopsyllus horridus* spec. (text-fig. 41).

♂♀. A near relation of *D. longifrons*, from which it differs chiefly in the ♂-genitalia. The upper and lower autepygidial bristles are of practically even length in the ♂ as well as the ♀. The last but one genal spine is broader than in *D. longifrons*. Both sexes have three rows of bristles on the pronotum, and a pronotal comb of thirty or thirty-one spines. The mesopleura bear 38 (37) bristles and the metepimerum 32 (33) in both sexes, the basal abdominal sternite having 15 (17) in the ♂, and 23 (23) in the ♀. The eighth sternite has on each side 56 (61) in the ♂, and the eighth tergite below the stigma 39 (41) in the ♀, while the seventh tergite bears on both sides together a row of twenty-three long bristles, and forty-eight additional bristles in the ♂, and sixteen and thirty-six

FIG. 41.—*Dinopsyllus horridus*.

respectively in the ♀, the numbers of bristles on the seventh sternite being in the ♂ 11 + 41, and in the ♀ 20 + 63. The species has a comb on the first abdominal tergite in both sexes, the spines in the other abdominal combs being in the ♂ 2, 7, 8, 9, 3 (1, 8, 8, 9, 3) and in the ♀ 2, 8, 9, 8, 0 (2, 7, 8, 8, 0).

The ninth tergite (text-fig. 41) of the ♂ has six or seven long bristles at the oblique distal margin. The long process of the clasper is less widened in the middle than in *D. longifrons*, and its upper distal angle a little less prominent. The ninth sternite (IX. st.) is much slenderer distally than in any of the other species, and bears a dense comb of bristles from the apex to the centre, the series being interrupted twice (text-fig. 41).

Length (mounted specimens): ♂ 3.5 mm., ♀ 4.3 mm.

1 ♂ and 1 ♀ from Pedreira, Angola, November 12, 1904, off *Petromys campanae*, collected by Dr. W. J. Ansorge.



The ♀ specimen bears on the sixth abdominal segment a long and stout apical bristle corresponding to the antepygial bristles of the seventh segment. The apical margin is sinuate where this bristle is placed.

#### 40. *Dinopsyllus ingens* Roths. (1900).

*Typhlopsylla ingens* Rothschild, *Ent. Rec.* xii. p. 37. t. 2. fig. 4 (1900) (Cape Colony).

A strongly modified species. The combs of the head and abdomen have almost disappeared, while the bristles, particularly those on the legs, are more numerous and longer than in any other species of *Dinopsyllus*. The species is only known from South Africa.

Key to the species of *Dinopsyllus*:

#### I. Surface of body densely reticulated; five genal spines.

- a. Comb of third abdominal segment containing at least eight spines, metepimerum with at least thirty-five bristles. *D. echinus* spec. nov.  
 Comb of third abdominal segment containing three spines, metepimerum with twenty-seven or less bristles . . . *D. hirsutus* Roths. (1908)

#### II. Surface of body with dorso-ventral lines; five genal spines.

- A. ♂♂ (not known of *eremus*).  
 b. Vestigial frontal tubercle in or below centre of frons . . . . . *e*.  
 " " " above centre of frons . . . . . *d*.  
 c. The two bristles placed near the ventral distal angle of the eighth sternite close together . . . . . *D. ellobius* Roths. (1805)  
 These two bristles widely apart . . . . . *D. kempii* spec. nov.  
 d. Long process of clasper curved upwards from base to centre . . . . .  
*D. gryppurus* spec. nov.  
 The upper and undersides of this process convex . . . . . *e*.  
 e. Ventral apical angle of eighth sternite strongly produced; two bristles at tip of angle very close together . . . . . *D. apistus* spec. nov.  
 The angle rounded off . . . . . *f*.  
 f. The row of bristles on the ninth sternite almost continuous . . . . .  
*D. horridus* spec. nov.  
 The row widely interrupted . . . . . *g*.  
 g. Combs on second and third abdominal segments with eight or more spines . . . . . *D. longifrons* spec. nov.  
 These combs with six or less spines . . . . . *D. lypusus* spec. nov.  
 B. ♀♀ (not known of *kempii* and *gryppurus*).  
 h. Head of receptaculum seminis without hump . . . . . *D. eremus* spec. nov.  
 " " " with prominent hump . . . . . *i*.  
 i. Metepimerum with more than twenty-eight bristles . . . . . *j*.  
 " " " less than twenty-six " . . . . . *k*.  
 j. First abdominal tergite with apical spines . . . . . *D. horridus* spec. nov.  
 " " " without apical spines . . . . . *D. longifrons* spec. nov.  
 k. Distance from frontal oral angle to tip of first genal spine larger than distance to frontal tubercle . . . . . *D. ellobius* Roths. (1905)  
 The former distance shorter than the latter. *D. lypusus* spec. nov. and  
*D. apistus* spec. nov.  
 III. 0 to 2 genal spines . . . . . *D. ingens* Roths. (1900)

**Hypsophthalmus** gen. nov.

♂ ♀. Allied to *Chimaeropsylla*, *Dinopsyllus*, *Palaeopsylla* and *Leptopsylla*. Genal comb vertical. Eye near base of antenna. Labial palpus consisting of four segments. Frons without short stout spiniform bristles near anterior margin. Mandibles slender. One long antepygial bristle accompanied by two very small ones. Vertical lines of metepimerum ventrally not more numerous than dorsally. Hindcoxa on inner surface with a comb or patch of small spiniform bristles. Fifth segment in all tarsi with four pairs of plantar bristles, all lateral.

Genotype: *H. campestris* spec. nov.

We also place here the species described as *Ctenopsyllus aganippes* Roths. (1902) and *Ctenopsyllus granti* Roths. (1904), both from the Cape Colony. The three species agree in the characters mentioned above, but differ *inter se* so widely in other structures that they may ultimately be classified under different genera.

41. **Hypsophthalmus campestris** spec. nov. (text-figs. 42, 43 and 44).

♂ ♀. The frons is almost evenly curved, being minutely angulate just below the centre. The structure of the skeleton is different above and below the angle,

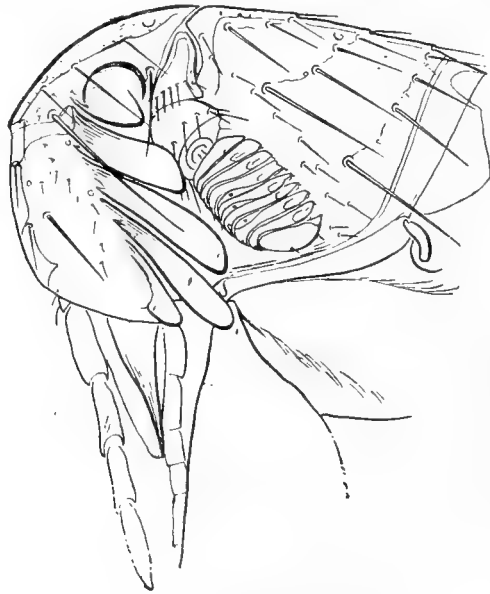


FIG. 42.—*Hypsophthalmus campestris* ♀.

as is also the case in *Leptopsylla* (and some other genera). An internal incassation situated below the angle extends from the anterior edge of the frons inwards, terminating and being most strongly chitinised near the base of the last but one genal spine (counted from below). There is a row of six bristles along the frontal edge, one bristle behind the eye, a second in front of the penultimate genal spine, and a third nearly on a level with the most ventral bristle of the anterior row. On the portion of the frons below the angle there are three pale dots, two being placed close to the comb and the third towards the anterior margin. The genal comb contains five spines as in *Dinopsyllus*, the second from below being the longest.

All the spines are rounded at the tip. Above the comb in close proximity to the last spine there is the strongly chitinised eye, which appears to be reduced as regards its function as an organ of sight. The occiput has three rows of bristles. The antennal groove is closed. The bristles on the second segment of the antenna are short in both sexes. The club reaches to the hindmargin of the antennal groove, being very little shorter in the ♀ than in the ♂. The proboscis extends a little beyond the centre of the forecoxa.

*Thorax.*—The pronotum has one row of bristles and a comb of twelve obtuse spines, the apical lobe situated below the comb being about as wide as two spines taken together. The mesonotum, which is somewhat shorter than the metanotum, bears two rows of bristles, some additional dorsal bristles and a basal row of very small ones, besides some internal subapical setiform spines, of which one is placed a short distance above the ventral angle. The mesopleura have five or six bristles. There are two bristles, one long and one short, on the metepisternum, one on the metasternum, two complete rows and an incomplete one on the metanotum, and six or seven bristles (3, 3 or 4) on the metepimerum. The apical edge of the metanotum is denticulate like the abdominal tergites, but has no spines.

*Abdomen.*—The tergites bear two rows of bristles, but the anterior row is only represented by a few bristles on the posterior segments. One bristle is placed below the stigma. The posterior row contains twelve or thirteen bristles on the central segments. Tergites I to IV or V have one or more apical spines. The antepygial bristle is rather short and stumpy. The sternites of segments III to VII in the ♂ and III to VI in the ♀ bear four long bristles on the two sides together, sternite VII of the ♀ seven or eight, there being no small bristles in front of the row.

*Legs.*—The subapical sinus of the hindcoxa is very shallow, the angle above it being but very slightly prominent. The comb on the inner surface of this coxa consists of six or seven spiniform bristles. All the femora bear in the apical half about half a dozen subdorsal bristles and two ventral subapical ones, there being an additional bristle above and somewhat posterior to the second subapical one on the mid- and hindfemora and two or three lateral ones on the forefemur. The inside of the femora bears a small ventral bristle near the apex and a subventral one (occasionally absent) towards the base. The tibiae are covered on the outside with numerous bristles (about thirty on the hindtibia, apart from those placed at the anterior edge) and their dorsal edge bears five pairs of bristles exclusive of the apical bristles. There are two more single bristles in between the second and third and fourth and fifth pairs respectively. Of the dorsal bristles of the tibiae the outer ones do not form a comb, as in the case of *Leptopsylla* and *Hypsophthalmus aganippes*. The apical bristles of the hindtarsal segments do not extend to the apex of the next segment, the first segment bearing the longest bristle, which nearly reaches to the apical bristle of the second segment. The fourth hindtarsal segment is twice as long as it is broad. The measurements of the tarsi are as follows:

Foretarsus :	♂, 8, 9, 7, 6, 15 ;	♀, 9, 9, 8, 6, 16.
Midtarsus :	♂, 16, 15, 10, 7, 15 ;	♀, 17, 16, 11, 8, 16.
Hindtarsus :	♂, 30, 23, 15, 9, 17 ;	♀, 34, 24, 14, 9, 17.

*Modified Segments.*—♂. The eighth sternite is much larger than the tergite. Its apical margin is rounded, but the ventral angle is produced (text-fig. 43) and

bears five bristles on the two sides together. The body of the clasper (Cl) is very large. Its distal margin is nearly straight, with the dorsal angle slightly and the

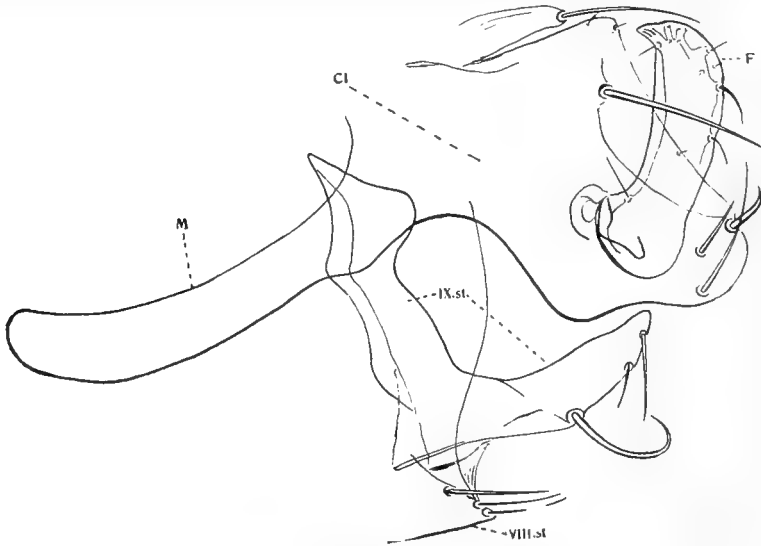


FIG. 43.—*Hypsophthalmus campestris*.

ventral angle strongly rounded. The dorsal margin is placed almost at right angles to the distal one. The clasper is very strongly dilated ventrally from near the base

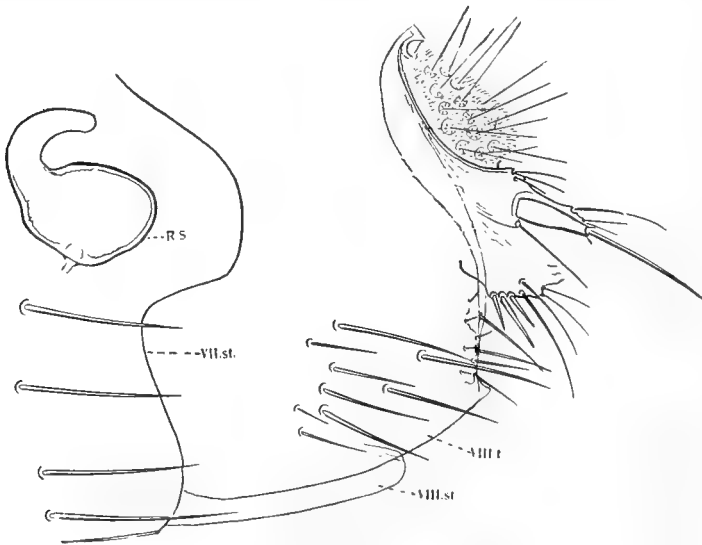


FIG. 44.—*Hypsophthalmus campestris*.

of the manubrium, as shown in the figure, and bears some minute bristles at the dorsal angle, a long one farther down, and a row of three above the rounded ventral

angle. The manubrium is long and has a rounded apex. The internal arm of the elbowed ninth sternite (text-fig. 43, IX. st.) is broad. Its dilated apical portion is rounded on the distal side, while its proximal upper angle is acute, and produced obliquely upward. The horizontal arm is widest in the centre, nearly straight above, almost evenly rounded beneath, and bears on the ventral margin three long bristles, of which the proximal one is large and curves distad, while the other two are thin and point ventrad.—♀. The seventh abdominal sternite (text-fig. 44) has a broad but shallow sinus which diminishes ventrally, the lobe placed above the sinus being very strongly rounded and projecting more than the ventral portion of the segment. The apex of the eighth tergite is truncate-rotundate and bears eight or nine bristles at and near the edge on the inner and outer surfaces together, there being farther proximally on the segment eight or nine more bristles, as shown in the figure (text-fig. 44, VIII. t.). The sensory plate is rather strongly convex. The anal tergite is transversely raised at the base and bears on this elevated portion a row of bristles, another set of bristles placed near the apex of the segment, but none in between the two sets. At the angle below the base of the stylet there is one bristle. The stylet is straight, conical, three times as long as it is broad at the base, and bears two minute bristles at a short distance from the long apical one. The anal sternite has ten bristles, of which one or two are stout. The receptaculum seminis has a large, irregularly-shaped head, which is nearly as broad as it is long, its aperture being ventral (as in *Ctenophthalmus*), not terminal. The tail is about as long as its head.

1 ♂ and 1 ♀ from Kumba, S.W. Uganda, June 30, 1911, off *Otomys* spec.;—type, ♂.

1 ♀ from the Igembu Hills, N.E. of Mt. Kenia, February 13, 1911, off *Thamnomys* spec.

#### 42. *Chimaeropsylla potis* Roths. (1912).

*Chimaeropsylla potis* Rothschild, *Bull. Ent. Research* ii., p. 270, fig. 1. 2. 3 (1912) (Zomba).

1 ♂ from Shimbo Hills, British East Africa, July 30, 1910, off *Rhynchocyon* spec. Originally described from Nyassaland, where both sexes were found on an elephant shrew, *Rhynchocyon cirnei* Peters.

The species has very broad and strong mandibles, recalling the *Sarcopsyllidae*.

#### 43. *Leptopsylla aethiopicus* Roths. (1908).

*Ctenopsyllus aethiopicus* Rothschild, in *Sjöstedt, Kilimandjaro-Kenia Exped.*, Siphon. p. 5. t. 1. fig. 8. 9 (1908) (Kibonoto).

1 ♀ from Mutaragwa, Aberdare Mts., British East Africa March 11–14, 1910, off *Thamnomys ibeanus*.

2 ♀ ♀ from Mt. Kenia, British East Africa, January 3, 1911, off *Thamnomys* spec.

1 ♂ from Mt. Mikenno, Belgian Congo, June 7, 1911, off *Thamnomys* spec.

SOME NEW *ANTHRIBIDAE* FROM AFRICA

BY DR. K. JORDAN.

1. *Physopterus melanoleucus* spec. nov.

♂ ♀. Niger, supra brunneo pubescens, vitta mediana dorsali luteo-alba pone elytrorum basin atque ante eorum apicem dilatata bene expressa ornatus, pronotum in dorso profunde impresso, carina in medio valde antrorsum flexa, elytris fasciculatis.

Long. (cap. excl.): 9–10 mm.

Durban, Natal (G. E. Leigh), 1 ♂ and 2 ♀.

Similar to *P. dorsovittis* Kolbe (1895, as *Platynorrhynchus*), but more robust. A broad stripe runs from the proboscis to near the tip of the elytra, being more or less clay-colour on the head and pronotum and almost pure white on the elytra. This stripe occupies the deep dorsal depression of the pronotum. On the elytra it is clayish at the base, reaches to the fifth interspace behind the subbasal callosity, and nearly to the lateral margin in front of the apex, occupying only interspaces 1–3 in the centre of the elytra. The frons is broader than in *P. dorsovittis*. The second segment of the ♂-antenna is a little shorter than the third. The dorsal impression of the pronotum is deeper than in *dorsovittis*, being flanked as in that species by a tufted tubercle; the carina is strongly, almost abruptly, curved forward in the centre and interrupted. The alternate interspaces of the elytra are elevated and bear tufts, of which the median one of the third interspace is the largest, being much larger than the corresponding tuft of *P. dorsovittis*.

Underside irregularly pubescent ochraceous; abdomen with two rows of greyish white spots on each side; tibiae with two brown rings; tarsi black, basal half of segment 1 and middle half of segment 4 white.

2. *Physopterus luctuatus* spec. nov.

♂ ♀. Niger, supra brunneo-nigro pubescens, griseo variegatus, infra griseo pubescens, lateribus russo et nigro notatis. Rostrum latum, latitudine dimidio longius, ad basin subtiliter sulcatum, rursus uti frons; hæc subtilissime carinata, vitta russa in occipite abrupte angustata, plus minusve griseo marginata. Pronotum in disco haud depressum, granulis dispersis instructum, vitta mediana late interrupta atque macula basali sublaterali russis notatum, carina dorsali fere recta, in medio paululo antrorsum curvata et minutissime interrupta, versus latera retrorsum flexa. Elytra omnino convexa, ad suturam haud depressa, interstitiis non elevatis, absque fasciulis, plaga magna communi sat indistincta e maculis parvis albo-griseis composita utrinque in medio profunde sinuata male determinata.

Long. (cap. excl.): 8 mm.

A small series from Nguelo, Usambara.

Easily recognised by the convex disc of the pronotum and the absence of tufts both on the pronotum and elytra. The pubescence of the upper surface is brownish black variegated at the sides with deep russet. The rostrum and frons are densely covered with russet pubescence; this broad stripe suddenly narrows to a narrow stripe beyond the centre of the eyes, and is here more or less edged with grey. The

stripe is again a little wider on the pronotum, but here reduced to two oblong spots, one apical and the other basal, the sides of the pronotum also bearing some russet pubescence. In contradistinction to the other species of *Physopterus* described from Africa [*sulcifrons* Fahr. (1839), *dorsovittis* Kolbe (1895), and *melanoleucus* spec. nov.] the pronotum is only depressed behind the carina, the centre of the disc being convex, apart from a slight flattening in front of the carina; the carina resembles that of *P. dorsovittis*. None of the interspaces of the elytra are raised, and all are practically of the same width; there are no tufts; the base, sides, and apex are more or less russet, while the sutural area from the subbasal depression to the apical declivity bears numerous greyish white spots, some being confluent, others isolated, the spots extending anteriorly and posteriorly to the fifth interspace, while they are restricted to the sutural interspace in the middle. The underside is grey, with the sides of the prothorax broadly black; the metasternum bears a russet lateral patch. The tibiae have two grey rings, which are sharply defined, the greater part of the first and fourth tarsal segments also being grey.

The rostrum is broader than in *P. dorsovittis*, the carinae are sharply marked, being convergent from the eyes forward and then divergent; the space between them is broadly depressed, bearing a median sulcus at the base and a slightly raised median line near the apex, the sulcus being replaced on the frons by a thin carina.

### 3. *Syntrophoderes sparsilis* spec. nov.

♂ ♀. *S. guineensi* similis, angustior, niger, luteo-griseo maculatus, processu metasternali longiore angustioreque.

*Hab.* Bailundu, Angola (ex coll. Ertl, type in Mus. Tring), 3 ♂♂ and 2 ♀♀.

Although very close to *S. guineensis* Kolbe (1895), which also occurs at Bailundu, the present insect is undoubtedly specifically distinct. It is narrower than *guineensis*, the intercoxal process of the mesosternum is shorter and the process of the metasternum consequently longer, the latter process being longer than it is broad, while in *guineensis* it is broader than long. The abdomen is rather more coarsely punctured, particularly the last three segments, and, in the ♂, more deeply depressed.

The upperside is pubescent black, with an inconspicuous intermixture of grey, and variegated with definite luteous grey spots. The prothorax bears about fourteen spots; the largest spots on the elytra are placed in interspaces 3 and 5, viz. one behind the base, a second in the middle, and a third at the commencement of the apical declivity, the suture and interspaces 7 and 9 being conspicuously dotted with luteous grey. The greyish white median ring of the tibiae is sharply defined.

### 4. *Polycorynus longicornis* spec. nov.

♂ ♀. *P. compressicornis* similis, magis elongatus, antennis longioribus, in ♂ haud spinosis, rostro intra antennas et prosterno ante coxas magis elevatis atque in medio minus depressis.

*Hab.* Lukuledi, German East Africa (in Mus. Tring, type); Bailundu, Angola (in coll. Ertl); a series, the ♀♀ all from Bailundu.

Slenderer and on the whole a little darker than *P. compressicornis* F. (1801). The antennae are longer, particularly in the ♂, in which sex they extend far beyond the pygidium, reaching in the ♀ well beyond the humeral angle of the elytra. The narrow basal portion of the first segment is only about the length of the broad distal

portion in both sexes. In the ♂ segments 3 to 7 are subcylindrical with the apex incrassate, there being no groove on the inner surface and no apical spines, as is the case in the ♂ of *P. compressicornis*; segment 8 is rather more compressed than 7, 9 similar to 8 in shape, except in being slightly broader and flatter, 10 and 11 together less than half the length of 9, the underside of 8 to 11 not pilose. In the ♀ 8 is less strongly narrowed basad than in *P. compressicornis*, and 9 is about as long as 8, being more than twice as long as 10. The prothorax is longer than in *P. compressicornis*, and the angle of the carina on the whole projects a little farther backwards.

#### 5. *Phloeobiopsis plagifer* spec. nov.

♂ ♀. Niger, griseo et fusco pubescens, albo et ochraceo variegatus; antennis simplicibus, pronoto ac elytris tuberculis parvis penicillatis instructis, elytris ad apicem et in utroque disco griseo-albis.

Long. (cap. excl.): 8–12 mm.

Fort Johnstone, Nyassaland, January—February 1896 (Dr. P. Rendall), type; Caffraria; Windhoek, German S.W. Africa; Kigonsera and Lukuledi, German East Africa; a small series of both sexes.

Shaft of antenna rufescent, with grey pubescence, segment 8 half as long again (♀) or twice as long as broad (♂), club broad, segment 10 half as broad again as long, 11 obtuse, slightly longer than broad, emarginate on the anterior side. Upperside of head and thorax covered with a fuscous pubescence densely shaded with dark ochraceous, and here and there variegated with greyish dots; rostrum transversely depressed at base and again at apex; frons without median groove. Pronotum depressed on the disc, with a transverse row of three distinct tufts. The alternate interspaces of the elytra are slightly raised, especially 3, 5 and 7, which bear small tufts; the suture and the lateral margin are tessellated grey and fuscous, and the interspaces 2, 4, 6, 8 and 10, more or less evenly dirty ochraceous, apart from the large greyish white median patch situated on each elytrum. Pygidium greyish or yellowish white, like the apex of the elytra. Underside and legs grey, somewhat variegated with fuscous. Tibiae with three ill-defined fuscous patches on the upperside and three whitish rings.

#### 6. *Phloeobiopsis simplex* spec. nov.

♀. Niger, supra fusco pubescens, umbrino variegatus albo-griseo subtessellatus, subtus pube griseo-umbrina vestitus; antennarum articulo 3<sup>o</sup> quarto longiore, pronoto elytrisque sine tuberculis penicillisque, illo haud depresso, his sat fortiter convexis; processu mesosternali ad latera leviter angulato.

Long. (cap. excl.): 9 mm.

Togo, West Africa, 1 ♀.

The species reminds one by its style of coloration of *Dendrotrogus hypocrita* Jekel and the species of *Basitropis*. The shaft of the antenna and the legs are somewhat rufescent. Segment 8 of the antenna is but little longer than broad, while 11 is about twice as long as it is broad. The frons bears a very shallow median depression flanked by two slightly raised lines which are divergent anteriorly and disappear before reaching the apex of the rostrum. The pronotum is coarsely rugate-punctate except at the apex, and somewhat flattened before the carina, but not impressed on the disc; there is a pair of greyish white dots on each side of the



disc, and a second, confluent, pair farther towards the side. The interspaces 2, 4, 6, 8 and 10 of the elytra are umber-colour, while the other interspaces as well as the outer margin are more or less distinctly chequered fuscous and greyish white; a median space on each elytrum and a larger one in front of the apical declivity are more extended fuscous than the rest of the elytra. The pygidium is twice as broad as it is long (apart from the elevate basal portion covered by the elytra), being almost perfectly semicircular. The sides of the sterna are very coarsely punctured; the mesosternal intercoxal process is distinctly angulate at the sides.

#### 7. *Phloeobiopsis gracilis* spec. nov.

♂ ♀. Griseus, capite et pronoti medio fulvo signatis, elytris linea nigra a sutura oblique ad limbum extensa; antennis ♂ medium elytrorum attingentibus, articulis 4°—8° dilatatis, pronoto tri-tuberculato, elytris interstitiis alternis subelevatis pustulosis.

Long. (cap. excl.): 3–5 mm.

Durban, Natal (G. F. Leigh), a small series of both sexes.

The prevalent colour of the pubescence is grey, with a yellowish tone here and there. The very short rostrum bears a transverse fulvous patch at the base, and there is a similarly coloured patch in the centre of the pronotum. The alternate interspaces of the elytra are elevate and bear small pustules, which are numerous in interspaces 1, 3 and 5, some being pale ochraceous, the others black or fuscous; from before the middle of the suture a black line runs obliquely backwards to the outer margin, bounding the apical declivity laterally, the two lines together having somewhat the shape of a lyre. Rostrum, antennae and the greater part of the legs rufescent; tip of mandibles black. Second segment of antennae as long as 1 and 2 together, in the ♂ 4 to 8 anteriorly dilated, as broad as the club, 11 elongate-ovate in ♂ and ♀, practically symmetrical. Pronotum oblong, the sides moderately rounded before the centre, the apical angle projecting, the basal angle obtuse, in centre of 6 a tubercle bearing black pubescence and being flanked by two oblique short ridges which are placed a little nearer the apex; farther laterally a vestigial additional tubercle. Scutellum white, nearly twice as long as it is broad. Elytra cylindrical, the sutural interspace only flattened at the apex. Pygidium much broader than long, subtruncate, the pubescence raised in the middle line. The lateral posterior angles of the last two abdominal sternites distinctly project in a dorsal view. Pubescence of tibiae long.

LIST OF MAMMALS OBTAINED BY THE HON. WALTER  
ROTHSCHILD, ERNST HARTERT AND CARL HILGERT  
IN WESTERN ALGERIA DURING 1913.

By OLDFIELD THOMAS.

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DURING April and May of the present year a collecting expedition to Western Algeria was made, and Mr. Rothschild took with him for the purpose of trapping and skinning small mammals a special collector, Mr. Alan Ruddle, to whose care and attention the excellent condition of the specimens is due.

Apart from a few odd specimens obtained near the town of Algiers the collection was made at two localities—Oran, on the coast in the north, and Aïn Sefra, in the mountains in the centre of Western Algeria, both being regions unrepresented in our series of N. African mammalia.

As a consequence the series forms a very valuable addition to the available material, and I have therefore thought an enumeration of all the specimens would be useful.

The most interesting specimens are the Elephant Shrews from Oran, as that being the typical locality of Duvernoy's *E. rozeti*, they have enabled me to examine and describe a number of other forms of the genus in the British and Tring Museums. I have also ventured to describe the Hare of Aïn Sefra as a new species.

In all 129 specimens were collected during the trip, a very creditable number considering the limited time available for the purpose.

1. *Pipistrellus kuhli* Natt.

♂: 59, 83, 102, 109, 110, 111, 112, 113, 114; ♀: 118, 119, 120. Aïn Sefra, 1100 m.

2. *Erinaceus algirus* Duv.

♂: 30. Lalla Marnia, W. Algeria. 360 m.

3. *Elephantulus rozeti* Duv.

♂: 19; ♀: 22. Mt. Mourdjadjo, Oran. 400 m.

Topotypes of the species, which was described by Duvernoy from Oran in 1832.

The arrival of these two excellent examples of the typical *E. rozeti* creates an opportunity to examine certain specimens from Morocco which have been for some years in the British and Tring Museums under the general name of *rozeti*. These appear to belong to two new forms, which may be considered as subspecies of *E. rozeti*, as they are both of the larger size distinguishing that species from the smaller *E. deserti* of Biskra and the Southern Atlas.

**Elephantulus rozeti moratus** subsp. n.

Size of *rozeti*. Colour of back more pinkish fawn as compared with the écrn drab of true *rozeti*, the darker dorsal area narrower, so that the much lighter buffy sides are visible in an upper view. Area at base of and behind ears more or less prominently ochraceous.

Skull as in *rozeti*.

Dimensions of the type:—

Hindfoot, 35 mm.

Skull, greatest length, 35·3; condylo-basal length, 32·7; zygomatic breadth, 21; nasals, 14·5; interorbital breadth, 7·3; breadth of braincase, 15·6; upper tooth series, 17·8.

*Hab.* S.W. Morocco. Type from Djebel Chedar, about 80 kilometres S.E. of Mazagan.

*Type.* Adult female. B. M. No. 4.7.5.5. Collected April 10, 1904, by F. Riggenbach.

Four specimens in the British and five in the Tring Museum from the type locality, and one from the Desert of Zragna (E. G. B. Meade Waldo).

Distinguished by its more buffy or pinkish fawn-colour, and by the narrowing of the dark dorsal area, which permits the lighter colour of the sides to be seen from above.

**Elephantulus rozeti atlantis** subsp. n.

Size as in *rozeti*. Colour pale brown or dark isabella. Sides paler than back, but not conspicuously so, a line edging the belly inclining to pinkish buff. No ochraceous area at base of or behind ears.

Skull comparatively large.

Dimensions of the type:

Hind-foot, 35 mm.

Skull, greatest length, 35·5; condylo-basal length, 32·7; zygomatic breadth, 20·3; nasals, 14; interorbital breadth, 7; breadth of braincase, 15·5; upper tooth series, 18·7.

*Hab.* Aïn Moussa, S. of Seksawa, northern slope of the Great Atlas of Morocco (approximately 31° N., 8° 20' W.).

*Type.* Adult male, B.M. No. 7.6.17.1. Collected April 20, 1905, by F. W. Riggenbach.

The specimen on which this subspecies is founded is less buffy or rosaceous than the other N. African *Elephantuli* in the collection. But there is in the Tring Museum a specimen from Tless, Duiran, Atlas, which may be provisionally referred to the same form, and this is coloured something like dark examples of *E. deserti*.

**4. Elephantulus deserti** Thos.

♂: 50 (young). Aïn Sefra, 1100 mm.

The colour of this young specimen is quite as in the Biskra *E. deserti*, different as is the altitude at which it was obtained. No doubt its colour is due to the sand-dunes near Aïn Sefra, which cause it to have the typical desert colour found in the Biskra animals.

On the other hand a number of specimens obtained during a previous

expedition of Mr. Rothschild on the plateau to the north-west of Biskra are of so different a colour as to deserve subspecific distinction from the desert race.

The new form may be called

### ***Elephantulus deserti clivorum* subsp. n.**

Essential characters of true *deserti*, but colour darker, the vinaceous pinkish buff of that animal being overlaid with a darker shade, chiefly due to the numerous black tips to the hairs. As a result the general tone approaches "drab-grey," though still with a strong suffusion of buffy. Sides less clear buffy than in *deserti*, more drab-coloured. White colour of undersurface apparently covering less of the flanks than in *deserti*.

Dimensions of the type, measured in the flesh :

Head and body, 98 mm. ; tail, 101 ; hind-foot, 32 ; ear, 25.

Skull, greatest length, 33 ; condylo-basal length, 30·5 ; zygomatic breadth, 19·7 ; upper tooth series, 17.

*Hab.* Plateau of Eastern Algeria ; type from Guelt-es-Stel, alt. 900 m.

*Type.* Adult female, B.M. No. 12.6.12.45. Original number 80. Collected and presented by Dr. K. Jordan. Four specimens from Guelt-es-Stel and one from Maafa (W. H. Lindsay) examined, as compared with nearly a score of the true *deserti*.

I have also seen a specimen from Matmata, South Tunis, collected by Miss H. L. M. Pixell, which appeared to belong to this subspecies.

### **5. *Crocidura russula mauritanica* Pomel.**

*Sorex mauritanicus* Pomel, *C.R.* xlii. p. 653. 1856.

*Sorex agilis* Levaillant, *Expl. Sci. Algérie, Mamm. Atl.* pl. 4. fig. 2. (Date uncertain—cannot be accepted as anterior to Loche's text.) (Young).

*Pachyura agilis* Loche, *Cat. Mamm. Algérie* p. 18. 1858. (nom. nud.) ; *Expl. Sci. Algérie, Mamm.* p. 87, 1867.

*Crocidura araneus* Lataste, *Mamm. Barbarie, Act. Linn. Soc. Bord.* xxxix. p. 206. 1885.

♂ : 5, 6 ; ♀ : 1, 3. Algiers.

The N. African representative of the common White-toothed Shrew is distinctly darker than its European ally, with a particularly dark-coloured head, and is no doubt worthy of subspecific recognition.

The animal figured by Levaillant as *Sorex agilis*—on which the *Pachyura agilis* of Loche is founded—is obviously a young example of this common Shrew. Loche saw no specimen of it, and had no real evidence as to its being a *Pachyura*.

### **6. *Crocidura whitakeri* de Winton.**

*Crocidura suaveolens* Lataste, *Mamm. Barb.* p. 209 (*nec* Pall.).

♂ : 47, 66. Ain Sefra, 1100 m.

These are the first Algerian examples of the smaller Shrew referred by Lataste to *C. suaveolens* that I have seen, and they are therefore most welcome. As already stated, I do not think that Levaillant's *Sorex agilis* is anything but a young specimen of the common large *Crocidura*, so that the name is not applicable to the present species, in whose synonymy it was placed by Lataste.

But I cannot find any difference of importance between these specimens and

de Winton's *C. whitakeri*, described from an example obtained in S.W. Morocco by E. Dodson, and therefore now use that name for them.

This Shrew is of a beautiful pale ashy colour, far paler than that of *C. russula*.

7. *Gerbillus hirtipes* Lat.

♂ : 33, 46, 51, 52, 53, 54, 56, 63, 64, 77; ♀ : 34, 35, 40, 41, 55, 57, 58, 61, 62, 65, 73, 74, 107. Aïn Sefra, 1100 m.

8. *Dipodillus campestris* Lev.

♂ : 8, 10, 12, 13, 15, 20, 23; ♀ : 9, 14, 24, 26. Mt. Mourdjadjo, Oran. Alt. 400 m.

This nice series will be of much value when this most difficult group is worked out. The exact relations to each other of *D. campestris*, *D. c. rozsikae*, and *D. dodsoni* are still very doubtful and need series from many places—notably the type locality, Philippeville—before they can be satisfactorily cleared up.

9. *Dipodillus campestris rozsikae*\* Thos.

♂ : 127 (young); ♀ : 96 (immature). Aïn Sefra, 1100 m.

Owing to neither specimen being fully adult it is difficult to be sure of these determinations, but it would appear that both *rozsikae* and *dodsoni* occur side by side at Aïn Sefra just as at Biskra.

While at Oran *Dipodillus* is the common Gerbil, so that a series of *D. campestris* was easily found, the genus is comparatively rare in the more desert country to the south, probably owing to the competition and dominance of the hairy-footed *Gerbillus hirtipes*.

10. *Dipodillus dodsoni* Thos.

♂ : 81, and separate skull. Aïn Sefra, 1100 m.

Typical locality. Aïn Hammam, Tripoli.

11. *Pachyuromys duprasi* Lat.

♂ : 126. Aïn Sefra, 1100 m.

Unfortunately quite young. Adult wild-killed examples of the "Boubèda" are still much wanted, as the majority of the specimens in different museums are the offspring of those kept alive in Paris by M. Lataste.

12. *Meriones shawi* Rozet.

♂ : 49, 60, 67, 69, 70, 72, 75, 76, 78, 80, 88, 89, 90, 91, 99, 125; ♀ : 42, 43, 68, 71, 79, 82, 84, 86, 87, 93, 97. Aïn Sefra, 1100 m.

As usual, the most common small mammal of the locality.

\* Misspelt *rozsikae* in original description. This mistake may be corrected as being what the International Code terms an "error of transcription."

13. *Meriones schousboei* Loche.

♂: 122, 124; ♀: 92, 98, 106, 121, 123. Aïn Sefra.

In this locality at least the present species is distinguishable from the common Djerd not only by its larger bullae, but by its more heavily blackened and tufted tail, whose end is to a certain extent black below as well as above, which is not the case in *M. shawi*.

14. *Mus musculus* L.

♂: 32. Aïn Sefra, 1100 m.

The specimens of both *M. algirus* and *M. musculus* are marked as having been caught in the hotel. The latter, though paler than N. European *musculus*, has the characteristic muddy-coloured belly, white digits and comparatively long tail of that animal.

15. *Mus algirus* Pomel.

♂: 38, 39, 44, 94; ♀: 36, 37, 95. Aïn Sefra, 1100 m.

16. *Apodemus sylvaticus hayi* Waterh.

♂: 2, 4; ♀: 7. Algiers.

♂: 11, 17, 18, 21, 25; ♀: 16. Mt. Mourdjadjo, Oran, 400 m.

♂: 28, 29; ♀: 27. Hills above Bou Médine, near Tlemçen, 900 m.

17. *Jaculus gerboa* Oliv.

♀ 129 (young). Hammam R'hira, N. Algeria, 500 m.

18. *Jaculus jaculus deserti* Loche.

♂: 100, 101, 103, 105, 116; ♀: 48, 104, 115. Aïn Sefra.

The characteristics of the five subspecies which may be recognised of the smaller N. African *Jerboa* are pointed out *Ann. Mag. N. H.* (9) xi. p. 484, 1913.

19. *Lepus sefranus* sp. n.

♂: 45, 117; ♀: 31, 108. Aïn Sefra, 1,100 m.

A hare with a strong pinkish suffusion in its colour.

Size and other characters about as in *L. pallidior* or *tunetæ*, but the general colour strongly suffused with pinkish, so as almost to approach Ridgway's "vinaceous-buff," the other N. African species being "cream-buff" or "pinkish buff." Crown distinctly more buffy than in *L. sherif*, which in some respects this species most resembles. Ears pinkish buff, the dark edge at their tips reduced to a minimum. Nape strong buffy pinkish, but, owing to the general pink colour of the animal, the nape is less contrasted with the back than usual. Chin and belly white; rest of undersurface pinkish buff. Tail not very long, its upperside black, its sides and undersurface white.

Dimensions of the type, measured in the flesh:

Head and body, 405 mm.; tail, 70; hind-foot, 108; ear, 105.

Skull, greatest length, 82; condylo-incisive length, 71.3.

An older skull has a greatest length of 84 mm., condylo-incisive length, 74.

*Hab.* As above.

*Type.* Female. No. 31. (B.M. No. 13.8.6.89.) Collected May 2, 1913.

All the N. African hares are very closely allied, belonging to but a single group of the genus, and it might almost be said that they belong to but a single species—in a broad sense—with a number of local races. Among these local races (for which at present it seems necessary to use binomial names) the Aïn Sefra hare is distinguished by its pinkish colour, which is of quite a different shade from that of *L. whitakeri*, and is absent in any other described form.

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## DESCRIPTION OF TWO NEW *SYNTOMIDS*.

BY THE HON. WALTER ROTHSCHILD, PH.D., F.R.S.

### *Metaxanthia aureiventris* sp. nov.

♀. Differs from *vespiformis* Druce by having the first two segments of the abdomen black above, while below the abdomen is entirely yellow. The hindwings are also more vitreous, the sooty black scaling being confined to the fringe.

*Hab.* Cananche, Cundiuamarca, July 1903 (M. de Mathan).

### *Metaxanthia atribasis* sp. nov.

♀. Differs from *vespiformis* in having the anterior half only of the first abdominal segment black above and below, the rest of abdomen entirely yellow. The forewings are more densely scaled.

*Hab.* Paramba, Ecuador, 3500 ft., March 1897, dry season (W. F. H. Rosenberg).

[The hitherto undescribed ♂ of *vespiformis* Druce has the basal two-thirds of forewing sooty black, and only the basal segment of the abdomen and the posterior half of the subbasal yellow.]

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ERNST HARTERT'S EXPEDITION TO THE CENTRAL  
WESTERN SAHARA \*

XV.

*RHYNCHOTA HETEROPTERA.*

BY DR. G. HORVÁTH.

DR. ERNST HARTERT, during his expedition to the Central Western Sahara, in 1912, also secured some *Rhynchota Heteroptera*. This small collection, and some other specimens collected by the Hon. Walter Rothschild and Ernst Hartert during former trips to the Northern West-Sahara and Algeria, have kindly been presented to the Hungarian National Museum in Budapest. There are in these collections 72 specimens, belonging to 37 species, of which four are new to science. One of the latter represents also the type of a new genus.

As to the itinerary and the localities, see *Nov. Zool.* xx. p. 1-27, also xviii. pp. 456-471.

**CYDNIDAE.**

1. *Amaurocoris aspericollis* Put.

1 ♀, Southern Oued Mya ; 1 ♀, El-Golea. Described from Tunisia.

**PENTATOMIDAE.**

2. *Odontotarsus grammicus* L.

5 ♂♂, 1 ♀, Hammam Rhira. This is the true Linnean species, which does not occur in Europe and is confined to North Africa.

3. *Graphosoma lineatum* L.

6 ♂♂, 2 ♀♀, Hammam Rhira. This species was described by Linnæus from "Mauritania." For a long time it has been overlooked and confounded with the European *Gr. italicum* Müll. I have, however, shown that these two species are quite distinct, and that only *Gr. lineatum* is found in North Africa. This latter species has also been found in Sardinia and Corsica, and once in Southern France, near Toulon (see *Ann. Mus. Hung.* vii. 1909, pp. 148-50).

4. *Aelia acuminata* L.

1 ♀, Hammam Rhira. A common widespread Palearctic species.

5. *Staria lunata* Hahn.

1 ♂, Hammam Rhira. Not rare in Central and South Europe, North Africa, and West Asia.

\* See *antea*, pp. 1-163, and pp. 444-469.



6. *Carpocoris pudicus* Poda.

2 ♂♂, 3 ♀♀, Hammam Rbira. The Algerian specimens of this very widespread species belong to a Southern variety characterized by the more or less acutely prominent lateral angles of the pronotum.

7. *Chroantha ornatula* H.-Sch.

1 ♂, Tougourt to El-Oned. Distributed in the Mediterranean region, as well as in Arabia, Persia and Transcaspia.

8. *Brachynema virens* Klug.

1 ♂, 1 ♀, half-way between Ouargla and El-Golea; 1 ♀, Southern Oued Mya; 1 ♂, north of El-Golea. This species was originally described from Egypt, but is recorded also from Algeria, Tunisia, South France, South Russia, the Caucasus, Turkestan and Syria.

9. *Nezara Heegeri*\* Fieb.

1 ♀, Biskra. A widespread insect, which occurs in the whole of the Mediterranean region, and is known also from the Canary Islands, Arabia, Somaliland, and Madagascar.

**COREIDAE.**

10. *Micrelytra fossularum* Rossi.

1 ♀, Hammam Rhira. A South European species, but known also from Algeria, Tunisia, and Morocco.

**LYGAEIDAE.**

11. *Spilostethus saxatilis* Scop. var. *lusitanicus* H.-Sch.

1 ♀, north of El-Golea. This variety lives only in Portugal, Spain, and Algeria.

12. *Spilostethus longulus* Dall.

1 ♂, Biskra. A North African species, but also recorded from Abyssinia, Shoa and Arabia.

13. *Spilostethus pandurus* Scop.

1 ♀, Hammam Rhira; 1 ♂, Biskra. A very widespread Mediterranean species, which is distributed also in the Ethiopian, Oriental, and Australian regions.

Var. *militaris* Fabr.—3 ♂♂, 4 ♀♀, Biskra.

14. *Spilostethus equestris* L., var. *lactans* Horv.

1 ♀, Hammam Rhira; 1 ♀, Hammam Meskoutine. This variety appears to be confined to Algeria.

15. *Spilostethus fulvipes* Dall.

1 ♂, Biskra. This species is recorded from Algeria, Egypt, Nubia, Arabia, and Persia.

\* By special request of the author dedication-names have been spelt with capitals.—ED.

16. *Melanocoryphus guttatus* Ramb.

1 ♀, Hammam Rhira. This species was hitherto always mixed up with *M. superbus* Poll., but is at once distinguished by the bright red tibiae. It was described originally from Spain, and is not rare in Algeria. The brachypterous form was published by me under the name var. *monostigma*, as a variety of *M. superbus*, and by O. M. Reuter under the name *M. Putoni* as a distinct species.

17. *Hyalocoris pilicornis* Jak.

1 ♂, Southern Oued Mya. This desert species was originally described from South Russia, but occurs also in Turkestan, and is already known from Algeria.

18. *Aphanus carbonarius* Ramb.

1 ♂, Hammam Rhira. This uncommon species was originally described from the South of Spain, and has been recorded from Algeria and Marocco.

19. *Camptocera Horváthi* Jak.

2 ♀♀, Oued Nssa, between Ghardaia and Guerrara. This species was described originally from South Russia and the Caucasus, but has been found since then in Turkestan, Syria, Tunisia, Algeria and Madeira.

## REDUVIDAE.

20. *Oncocephalus Putoni* Reut.

1 ♂, Hammam Meskoutine. Described from Algeria, and occurring also in Tunisia.

21. *Oncocephalus fasciatus* Reut.

1 ♂, Mraïer, between Biskra and Touggourt. Described from Onargia in the Sahara.

22. *Stirogaster desertorum* n. sp.

Pallide straminea; capite pronoto  $\frac{1}{5}$  brevior, nigro, ante antennis superne pallido, parte anteculari postoculari et oculo simul sumtis  $\frac{1}{4}$  brevior, fronte apicem versus leviter declivi, jugis inter antennis in dentes duos pallidos elevatis, vertice oculo fere  $\frac{1}{5}$  angustior, parte postoculari usque ad collum utrinque rotundato-angustata et tuberculis setigeris instructa; oculis valde exsertis, breviter setosis, subtus contiguus; articulis duobus basalibus antennarum longitudine aequalibus et pilis erectis longis vel longiusculis dense obsitis, articulo primo capite  $\frac{1}{2}$  longior, articulis apicalibus parce breviterque pilosis; rostro leviter infuscato, articulo primo articulo secundo sublongiore et paulo pone marginem anticum oculorum extenso; pronoto latitudine sua basali dimidio longiore, basi quam apice triplo latiore, subtiliter granulato, lobo antico quam postico circiter  $\frac{2}{3}$  brevior, pallido, angulis anticis extrorsum in dentem nigrum productis, lobo postico nigro-fusco, carinis duabus percurrentibus, retrorsum divergentibus instructo, angulis posticis haud vel vix prominulis, nonnihil elevatis et pallidis; scutello nigro-fusco, apice leviter elevato; elytris abdomine paulo longioribus et angustioribus, fascia diffusa, extus abbreviata pone medium, clavo, basi corii maculaeque magna, areas membranae occupante et interdum utrinque usque ad

margines laterales extensa, nigris; segmentis connexivi saepissime maculis marginalibus et apice ventris cum segmento genitali nigris vel nigricantibus; femoribus annulo subapicali nigro-fusco signatis; femoribus anticis pronoto capitique usque ad sulcum transversum simul sumtis longitudine aequalibus et altitudine maxima fere quintuplo longioribus; tibiis anticis leviter curvatis et quam femoribus anticis brevioribus. ♂. Long. 11–12 mill.

1 ♂, south of Ghardaïa. The Hungarian National Museum possesses also 1 ♂ from Beni Ounif, S.W. Algeria.

Differs from *St. Fausti* Jak. by the bicolorous pronotum and shorter elytra, surpassing only less the tip of the abdomen.

### 23. *Holotrichius* spec. ?

Southern Oued Mya. The single specimen is a nymph, and therefore the species cannot be recognized.

### 24. *Reduvius Harterti* n. sp.

Oblongus, flavo-albidus; capite nigro, apice pallido, ante oculos valde deflexo, pone oculos retrorsum fortiter angustato, vertice oculo  $\frac{1}{7}$  angustiore, gula inter oculos basi articuli tertii rostri aequalata; oculis valde exsertis; antennis pilis semierectis mediocribus sat dense vestitis et adhuc setis semierectis longioribus obsitis, articulis duobus basalibus cum basi articuli tertii flavo-albidis, articulis reliquis (basi articuli tertii excepta) infuscatis, articulo secundo articulo primo fere duplo longiore; pronoto nigro-fusco, opaco, lobo postico lobo antico distincte longiore, carinis pone medium destituto, angulis lateralibus obtusis, ultra marginem lateralem corii haud prominulis; scutello fusco-nigro, apice pallido, minus longe producto et parum recurvo; elytris flavo-albidis, apicem abdominis sat longe superantibus, clavo et corio basi nigris, parte reliqua illius fasciaque pone medium hujus stramineis, membrana nigra, macula magna apicali maculisque duabus lateralibus (una ad marginem apicalem corii, altera opposita limbi interioris) albis notata; pro- et metastethio (acetabulis exceptis) apiceque abdominis nigro-fuscis; connexivo et pedibus totis pallidis, immaculatis; tibiis anticis rectis, fossa spongiosa brevissima, partem decimam apicalem occupante, instructis; tarsis omnibus distincte triarticulatis, articulo prima tarsorum posticorum articulo secundo  $\frac{1}{4}$  brevior, articulis secundo et tertio longitudine aequalibus. ♂. Long. corp.  $11\frac{1}{2}$ , cum membrana  $12\frac{3}{4}$  mill.

1 ♂, Southern Oued Mya.

This species, named in honour of Dr. E. Hartert, is closely allied to *R. tabidus* Klug, but differs by the narrower vertex, the longer elytra, the pale clavus dark only at the base, the absence of the dark band of the corium, the less produced and at the apex less erected scutellum, as well as the entirely pale colour of all the femora.

### 25. *Pirates hybridus* Scop., var. *stridulus* Fabr.

1 ♂, Sidi Maklouf. This variety, which is distributed in the western parts of the Mediterranean region, represents perhaps a distinct species.

### 26. *Rhinocoris erythropus* L.

1 ♂, 2 ♂♂, Hammam Rhira. A Mediterranean species.

27. *Sphedanolestes sanguineus* Fabr., var. *albiventer* Rey.

1 ♂, Hammam Rhira. The typical form of this species inhabits the western parts of the Mediterranean region. The variety has been recorded from S. France and Algeria.

**CAPSIDAE.**28. *Phytocoris femoralis* Fieb.

1 ♂, Hammam Rhira. Recorded from the western parts of the Mediterranean region, but I have also received one specimen from Dalmatia.

29. *Calocoris hispanicus* Gmel., var. *nemoralis* Fabr.

1 ♂, Alger. A most variable Mediterranean species.  
Var. *piceus* Cyrill.—1 ♀, Hammam Meskoutine.

30. *Calocoris rubrinervis* H.-Sch.

1 ♂, Hammam Meskoutine. This species, recorded as living on *Tamarix*, is distributed in North Africa, Spain, Portugal, and the Canary Islands.

31. *Camptobrochis Martini* Put.

1 ♀, Oned Nssa, between Ghardaïa and Guerrara. This species was originally described from Biskra, but has been taken also in other localities of Algeria and recorded from Egypt, Cyprus, and the territory of Obock.

32. *Laemocoris strigifrons* Rent.

1 ♀, Biskra. Described from Tunisia.

33. *Linoceraea* nov. gen.

(*λίον* = thread ; *κερας* = horn.)

Corpus elongatum. Caput (♂) parvulum, subperpendiculare, a supero visum triangulare, pone oculos ne minime quidem constrictum, vertice horizontali, postice sinuato et distincte marginato, clypeo basi a fronte sat bene discreto, parum prominente, loris bene discretis, angustis, angulo faciali recto, gula peristomio aequilonga. Oculi pronoto contigui, magni, a latere visi ovoides, latera tota capitis occupantes, orbita interiore recti, paralleli. Antennae corpore paullo breviores, crassiusculae, filiformes, paullo infra lineam mediam oculorum insertae, articulis omnibus aequae crassis, articulo tertio articulo secundo  $\frac{1}{3}$  brevior et quam articulo quarto  $\frac{1}{2}$  longior, articulis duobus ultimis simul sumtis articulo secundo  $\frac{1}{2}$  longioribus. Rostrum coxas posticas attingens, articulo primo usque ad basin capitis extenso. Pronotum trapezoidem, antrorsum fortiter angustatum et convexo-declive, annulo collari sat lato instructum, basi subtruncatum, callis hand discretis. Scutellum basi bene discretum, parte apicali tumido-elevata. Elytra albo-signata, completa, parallela, cuneo parum declivi et extrorsum deflexo. Xyphus prosterni marginatus. Pedes mediocres; tibiis brevissime et tenuissime pilosulis; tarsis posticis articulo primo brevi, articulo secundo tertio paullo longiore; unguiculis leviter curvatis, aroliis brevissimis.

This genus may be placed near *Laemocoris* Jak. Reut. and *Cyrtopeltocoris* Reut., but differs from them by the structure of the head, the thicker antennae, and the not sinuated hind-margin of the pronotum.

***Linoceraea lunigera* n. sp.**

Rufescenti-ferruginea, nitida, superne pilis semierectis parce praedita, dimidio postico pronoti elytrisque nigris, his prope apicem scutelli macula transversa communi semilunari lactea ornatis; capite cum oculis latitudine basali pronoti fere  $\frac{1}{3}$  angustiore, vertice oculo  $\frac{1}{4}$  latiore, clypeo infuscato; antennis nigris, articulo primo basique articuli secundi flavo-testaceis, articulo secundo latitudine basali pronoti  $\frac{1}{4}$  brevior; pronoto basi quam annulo suo collari fere triplo latiore; elytris apicem abdominis sat longe superantibus, membrana nigro-fumata et nigro-venosa; lobo postico prostethii nigro; tibiis posticis tarsis posticis  $3\frac{1}{2}$  longioribus, his flavo-testaceis. ♂. Long. corp. 3, cum membrana  $3\frac{1}{2}$  mill.

1 ♂, Oued Nssa, between Ghardaïa and Guerrara.

**34. *Atomophora picticornis* n. sp.**

Superne albida, opaca, albido-pilosa; capite, pronoto et scutello dense fusco-variegatis; vertice oculo aequilato; antennis albidis, annulo subapicali articuli primi, annulis duobus (una versus basin, altera versus apicem) articuli secundi annulisque duobus (una basali, altera apicali) articuli tertii fuscis, articulo secundo latitudine basali pronoti  $\frac{1}{4}$  brevior; elytris fusco-punctatis et praesertim basin versus et ad marginem externum maculis badiis ornatis, cuneo maculis duabus majoribus, una basali interna, altera marginali externa, fusco-nigris notato, membrana fumata, albido-irrorata, venis albidis; corpore subtus fusco-sanguineo, obsolete albido-variegato; tibiis posticis albis, nigro-spinulosis, superne punctis magnis nigris signatis; tarsis posticis pallidis, apice fuscescentibus. ♂. Long. circiter  $2\frac{1}{4}$  mill.

1 ♂, Oued Nssa, between Ghardaïa and Guerrara.

Allied to *A. pantherina* Reut., but at once distinguished by the annulated antennae and the pale tarsi. The single specimen is in too bad conservation, and therefore does not permit of a more complete description.

**35. *Atomophora* spec ?**

1 ♀, Southern Oued Mya. The single specimen is unfortunately in very bad condition, and the identification impossible. It belongs probably to a new species.

**36. *Atomoscelis tomentosus* Reut.**

1 ♂, Southern Oued Mya. Described from Egypt.

**37. *Campylomma angustula* Reut.**

1 ♂, Southern Oued Mya; 2 ♀ ♀, Oued Nssa, half-way between Ghardaïa and Guerrara. Described from Egypt.

XVI.

LIST OF SAHARAN HYMENOPTERA COLLECTED BY  
DR. E. HARTERT.

BY THE REV. F. D. MORICE

Plate XV.

**Anthophila.**

*Andrena morio* Brullé.

1 ♀ ; Laghouat, 27. iv. 1911 (Hon. Walter Rothschild and E. Hartert).

*Anthophora ambigua* Perez.

2 ♀ ♀ ; El-Meksa (S. of El-Golea), 2. iv. 1912.

*Anthophora harmalae* Mor. var. ?

1 ♀ ; S. of Ghardaïa, 26-30. v. 1912.

(I name it with some hesitation, because the hind metatarsus is **entirely** black-haired, while Morawitz says only that it has a dark apical penicillus, and that the legs have white hairs externally and black internally. In all other points, however, it answers to the description of *harmalae*, and according to Friesi's tabulation, it should certainly be that species. I have an exactly similar ♀ from Biskra taken in June 1911.)

*Anthophora fulvitaris* Brullé.

2 ♀ ♀ ; Laghouat, 6. iv. 1911 (Hon. W. Rothschild and E. Hartert).

*Chalicodoma nasidens* Friese.

2 ♀ ♀ ; Ghardaïa (and S. of Ghardaïa), 26-30. v. 1912.

*Chalicodoma sicula* Rossi.

1 ♀ ; Laghouat, 4-11. iv. 1911 (Hon. W. Rothschild and E. Hartert).

*Eucera ephippia* Dours (sec. Friese).

1 ♀ ; Guelt es-Stel, 3. iv. 1911 (Hon. W. Rothschild and E. Hartert).

(According to Prof. Perez this species should be called *hispana* Dours.)

*Eucera numida* Lep.

1 ♀ ; Boghari, 3. iv. 1911 (Hon. W. Rothschild and E. Hartert).

*Melecta armata* Pz.

2 ♀ ♀ ; Laghouat, 6 and 8. iv. 1911 (Hon. W. Rothschild and E. Hartert).

**Diptoptera.**

*Polistes gallicus* F.

1 ♀ ; Boghari, 3. iv. 1911 (Hon. W. Rothschild and E. Hartert).

*Eumenes arbustorum* Pz.

1 ♀ ; S. of Ghardaïa, 26-30. v. 1912.

*Eumenes coarctatus* L. (= *pomiformis* D.T.), var. *mediterraneus* Kriechb.

1 ♀ ; El-Golea, May 1912.

*Eumenes dimidiatipennis* Sans.

2 ♀ ♀ ; Oued Mya, 4. v. 1912.

1 ♀ ; Sands of El-Arich, S.W. of Touggourt, 8-9. vi. 1912.

1 ♀ ; El-Golea, 10-13. v. 1912.

*Alastor harterti* n. sp. (see description *infra*).

1 ♀ ; S. of Ghardaïa, 26-30. v. 1912.

**Mutillidae.***Apterogyna morawitzi* Rad.

2 ♂ ♂ ; S. of Ghardaïa, 26-30. v. 1912.

*Apterogyna savignyi* Kl.

1 ♂ ; Oued Mya, iv. 1912.

2 ♂ ♂ ; S. of Ghardaïa, 26-30. v. 1912.

*Milluta chobauti* André.

1 ♂ ; Oued Nssa (Ghardaïa to Gnerrara), 3-5. vi. 1912.

(As far as I know this is the only specimen that has occurred since those described by André as taken at Ghardaïa by Dr. Chobaut. The ♀ is unknown.)

*Mutilla (Ephutomma) biskrensis* André.

1 ♂ ; S.W. of Touggourt, 8-9. vi. 1912.

1 ♂ ; S. of Ghardaïa, 26-30. v. 1912.

(Only ♀ ♀ of this species have yet been recorded. I took one of that sex at Tozeur in Tunisia in May of this year (1913).

These ♂ ♂ have exactly the same long and narrow thorax which characterizes the ♀, and I feel safe in associating them with it).

*Mutilla (Ephutomma) sanguinicollis* Kl.

2 ♂ ♂ ; Oued Mya, iv. 1912.

4 ♂ ♂ ; Oued Mya, 4. iv. 1912.

1 ♂ ; S. of Ghardaïa, 26-30. v. 1912.

(Probably, as André suggests, this ♂ is identical with *dichroa* Sich. & Rad., and I strongly suspect that its ♀ is *continua* F., in which case the latter name would claim priority.)

*Mutilla (Pseudophotopsis) kokpetica* Rad.

2 ♂ ♂ ; S. of Ghardaïa, 26-30. v. 1912.

*Mutilla (Pseudophotopsis) komarovi* Rad.

1 ♂ ; El-Golea, 10-13. v. 1912.

*Mutilla (Trichotabiodes) aegyptiaca* Rad.

1 ♂ ; Oued Mya, 4. v. 1912.

3 ♂ ♂ ; S. of Ghardaïa, 26-30. v. 1912.

**Scoliadae.***Elis (Trielis) carbonaria* Kl.

1 ♂ ; Laghouat 4-11. iv. 1911. (Hon. W. Rothschild and Ernst Hartert.)

**Pompilidae.**

*Pompilus platyacanthus* Kohl var.

1 ♀ ; Nza ben Rzig (between Biskra and Tougourt), 24. ii. 1912.

(This specimen differs from the type in being entirely black. It has the normal number of six dilated spines on the front metatarsus.)

*Pompilus polyspathus* n. sp. (See description *infra*.)

1 ♀ ; S. of Ghardaïa, 26-30. v. 1912.

*Salius eatoni* E. Saunders.

2 ♀ ♀ ; Ghardaïa 26-30. v. 1912.

**Sphecidae.**

*Ammophila (Psammophila) hirsuta* Scop.

1 ♀ ; Boghari, 3. iv. 1911.

*Ammophila (Psammophila) micipsa* Morice (Qy. = *ebenina* Spin. ?)

1 ♀ ; Sidi Maklouf, N. of Laghouat, 4. iv. 1911. (Hon. W. Rothschild and E. Hartert.)

*Ammophila (Psammophila) mauritanica* Mercet.

1 ♀ ; Ghardaïa 26-30. v. 1912.

*Sceliphron spirifex* L.

1 ♀ ; Sands of El-Arich, 8-9. vi. 1912.

*Stizus rufiventris* Rad.

1 ♀ ; Oued Nssa, 3-5. vi. 1912.

**Heterogyna.**

*Camponotus sylvaticus* Ol. (sec. André, *Species*, Tome II).

3 ♀ ♀ (one dealated) ; Tougourt, iv. 1909. (Hon. W. Rothschild and E. Hartert.)

1 ♀ ; Oued Mya, iv. 1912.

(Very large specimens, about 17 mm. long. Colour typical, according to André. My acquaintance with the *Formicidae* is very superficial !)

*Myrmecocystus (Cataglyphis) bombycinus* Rog.

1 ♂ ; Bon R'Mees, near El-Oued, 7. v. 1909. (Hon. W. Rothschild and E. Hartert.)

*Dorylus oraniensis* Lucas.

1 ♂ ; Biskra, 26. iv. 1909. (Hon. W. Rothschild and E. Hartert.)

(Also two small ♀ ♀ of *Formicidae* spp. which I cannot name confidently.)

**Chrysidæ.**

*Stilbum splendidum* F.

1 (♀ ?) Ghardaïa, 20. iv. 1911. (Hon. W. Rothschild and E. Hartert.)

**Chalastogastra.**

*Cephus (Trachelus) tabidus* F.

1 ♂ ; Hammam R'hira, North Algeria, 31. v. 1911. (Hon. W. Rothschild and E. Hartert.)



The following Ichneumonids, etc., have been determined by Mr. Claude Morley :

*Ophion obscurus* F.

3 (sex not stated) ; Bordj Ferjan, 41 kilom. E. of Touggourt, April 1909.  
1 ♀ ; Ghardaïa, 19. iv. 1911. (Hon. W. Rothschild and E. Hartert.)

*Paniscus planipes* Tosq.

2 ♀ ♀ ; Ghardaïa, 19 and 22. v. 1911. (Hon. W. Rothschild and E. Hartert.)

*Paniscus rufescens* Tosq.

1 ♀ ; Oued Mya, iv. 1912.

*Paniscus elegans* Szept.

1 ♀ ; Bordj Chegga, S. of Biskra, 21. ii. 1912.

*Mesochorus* sp.

1 ♀ ; Ghardaïa, 19. iv. 1911. (Hon. W. Rothschild and E. Hartert.)

*Rhogas* sp. (Braconid).

1 ; Ghardaïa, 19. iv. 1911. (Hon. W. Rothschild and E. Hartert.)

The following Braconids are as yet undetermined :

1 ♀ ; from S. of Ghardaïa, 26-30. v. 1912.

1 (♂ ?) from Oued Mya, iv. 1912.

DESCRIPTIONS OF THE NEW SPECIES.

***Pomphilus polyspathus* n. sp. ♀.**

*Pomphilus platyacantho* Kohl simillimus et affinis sed (ut videtur) maior, totus niger (exceptis oculorum marginibus externis angustissime et mandibulis in medio rufescentibus), subplumbeo-obscure sericans, alis valde infuscatis. Metatarsi antici serie duplici spinularum armantur, quarum non minus quam *novem* (!) in serie externa ante apices acutos lanceolatim dilatantur. Tempora pone oculos et prosternum pilis suberectis satisque longis sed tenuissimis mediocriter dense vestiuntur ; etiam in vertice, propodeo, segmentis dorsalibus abdominis primo et sexto pili similes sed rariores iuveniri possunt. (Long. corporis circa 22 mm.).

The insect is extremely like a colossal, very dark, specimen of *platyacanthus*, having precisely the same general structure—similarly formed head, propodeum, etc.,—very long and slender antennae, etc., and a double row of metatarsal spines. But Herr Kohl, whom I have consulted on the subject, tells me that he thinks it must be specifically distinct from his insect. Besides the much greater number (nine instead of six) of the dilated spines, the face of *polyspathus* appears to be considerably more transverse than in *platyacanthus*, the post-ocelli are certainly nearer to each other than to the compound eyes, and in the forewings the second cubital cell is (at least in the present specimen) longer as compared with the third than is the case with *platyacanthus*.

I notice that the surface of the abdomen, in a place where the pubescence is slightly rubbed, appears shining when viewed with a hand-lens, but under the compound microscope (one-inch power) is seen to be exceedingly closely and evenly covered with transverse rows of minute punctures, or rather "punctula," almost touching each other, but not in the least confluent or rugulose. Elsewhere the

density of the pubescence quite conceals the sculpture, and gives the insect a most funereal appearance.

***Alastor harterti* n. sp. ♀.**

*Alastor* (*Antalastor*) *magnitudine prorsus inusitata*—(long. corp. circa 15 mm. lat. abdom. 3 mm.)—*niger, uberrime flavo- et nonnusquam aurantiaco- vel etiam rufo-pictus*. Clypeus acute bidentatus, longitudine sua sesquialior. Pronotum in medio subproductum, lateribus rotundatis, vix angulatis, nequaquam spinulosis.

Black, with the following parts yellow :—

Mandibles, labrum, and mouth-parts. Base of clypeus (widely); between its base and the black apex the clypeus is rufescent. A tubercle between the antennae. The three basal joints of the antennae. The sinuses of the eyes—the yellow extending upwards a little beyond the actual sinus. Almost the entire tempora behind the eyes.

Pronotum, tegulae, and a spot on the episternum of the mesothorax. Scutellum, postscutellum, and sides of propodeum. Legs, except part of the coxae.

The whole first abdominal segment, except the middle part of its declivous base. A very broad apical fascia produced in the centre and more still at the sides (trilobate) on each of the following abdominal dorsal-plates except the last, which seems to be entirely black, and similarly shaped, but narrower fasciae at the apices of the second and third ventral-plates (the base of the second ventral, before its crenate impression, is testaceous).

The head and thorax (especially at the sides and beneath) and the abdomen beneath is clothed fairly densely but not conspicuously (except in the lateral view) with silvery sub-erect hairs. The pilosity on the dorsal surface is much shorter and less noticeable.

The very large tegulae, and also the base of the clypeus, a tuberculation between the antennae, the truncated apex of the postscutellum, and the middle (triangular) area of the propodeum, are smooth and shining; elsewhere the body is closely and for the most part rather strongly punctured.

The size and colour of the insect, and the very different form of the pronotum, at once distinguish this *Alastor* from *atropos* Lep., etc. The ♂ of a large Egyptian species has been figured but not described by Savigny (*Descr. de l'Ég.* Pl. ix. Fig. 16), and I have taken what I believe to be two ♂♂ of Savigny's species in Egypt. (Saussure appears to refer to this insect by the name *savignyi*, vol. iii. p. 328, but he does not expressly say so; he gives no description, and the name does not appear in his Indices, and is ignored in V. Dalla Torre's Catalogue.) It is possible that Savigny's ♂ and *Harterti* ♀ may prove to belong to a single species. The clypeus of the latter is, however, very much more transverse; and on the whole, though they resemble each other strikingly in size and distribution of colour, I do not venture without more evidence to unite them. (In both my Egyptian ♂♂ the yellow markings are very pale, almost lacteous, and show no tendency to rufescence; whereas in *Harterti* the markings are deep yellow and in places almost orange-coloured. Possibly the differences may be sexual, but I do not think this likely. Or they may be local, or even individual, but this is mere guess-work. When Algerian ♂♂ and Egyptian ♀♀ are discovered, the question may be definitely settled one way or the other!)

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## XVII.

## ORTHOPTÈRES.

PAR IGNACIO BOLIVAR.

Les Orthoptères du Sahara ont été l'objet de divers mémoires. Le Dr. H. Krauss en a énuméré plusieurs espèces dans "Beitrag zur Orthopterenfauna Orans (West-Algeriens)," \* et plus spécialement dans "Beitrag zur Kenntniss der Orthopterenfauna der Sahara," † et feu M. Finot a publié une "Liste des Orthoptères capturés dans le Sahara algérien," par M. le professeur Lameere. ‡ Plusieurs autres travaux sur la faune de l'Algérie, de Tunisie et d'Égypte permettent d'étudier facilement les orthoptères provenant de cette contrée. Toutefois les orthoptères recueillis par M. le Baron de Rothschild et par Dr. Ernst Hartert dans le Sahara occidental offrent un grand intérêt parce que, non seulement ils permettent de confirmer l'existence d'espèces déjà énumérées, mais surtout parce que parmi eux se trouvent des espèces nouvelles pour la science et d'autres espèces critiques très intéressantes pour en déterminer avec exactitude d'autres jusqu'ici douteuses.

Mais avant de commencer l'énumération de ces orthoptères, je tiens à témoigner ma gratitude à M. le Baron de Rothschild et à Dr. E. Hartert pour m'avoir permis de garder quelques exemplaires dans ma collection qui aujourd'hui fait partie des coll. entomologiques du Musée de Madrid par donation gracieuse que je viens d'en faire à cet établissement où désormais seront gardés tous les types de mes descriptions.

En vue d'éviter la confusion qui résulte de l'emploi de noms divers, d'après les appréciations de chaque auteur pour les familles et les genres, je me suis décidé à employer ceux adoptés par M. Kirby dans son récent Catalogue (*A Synonymic Catalogue of Orthoptera*, London, 1904-10), sacrifiant mes propres opinions afin de ne pas contribuer à augmenter cette confusion.

## FAM. BLATTIDAE.

1. *Loboptera decipiens* (Germar).

*Loc.* Hammam Meskoutine, N. Algérie, Mai 1909 (Rothschild et Hartert). M. Finot a résumé l'aire géographique de cette espèce dans ces termes (*Orth. d'Alg. et de Tun.*): "Europe méridionale: bords de la Méditerranée. Algérie: Oran, Chalet-el-Ameur, Tlemcen. Tunisie: Env. de Tunis, cap Bon, Oued-Zerga, Ferçana, pays des Kroumirs, ile Djerba." En outre, le Dr. Krauss l'a indiquée comme habitant Monastir. Elle habite aussi Madère, le Maroc, et l'Asie mineure.

2. *Polyphaga ursina* (Burmeister) (*livida* Finot nec Brunner).

*Loc.* Hassi El-Hadjar, S.W. of Ouargla, 15. iii. 1912 (Hartert); S. Oued Mya, C. Sahara, 4. v. 1912 (Hartert); Biskra, South Algeria (W. Rothschild et E. Hartert). Indiquée, pour l'Égypte et la Syrie, elle se trouve aussi en Tunisie,

\* *Zoolog. Jahrb.*, Neunter Band, 1896, pp. 515-556.† *Verhandl. k. k. Zool.-bot. Ges. Wien*, Jahrgang 1902, pp. 230-251.‡ *Ann. Soc. Ent. de Belgique*, tome xlvii. 1902, pp. 432-435.

Monastir (Dr. Krauss), à Biskra-Tougourt et Touggourt-Ouargla, et entre Gardaia et Guerrara.

Je pense aussi avec le Dr. Krauss que *P. livida* Finot ne diffère pas de *P. ursina* Burm. *P. livida* Brunner est une autre espèce propre à l'Archipel grec.

#### FAM. MANTIDAE.

##### 3. *Iris oratoria* (L.) var. *polystictica* Fisch. W.

*Loc.* Aïn Guettara, North of In-Salah, 12-14. iv. 1912 (Hartert); S. Oued Mya, Algerian C. Sahara, Mai 1912 (Hartert).

Les exemplaires de ces provenances constituent une variété que je rapporte à *polystictica* Fisch. W. par la coloration très affaiblie des ailes. Dans le ♂ elles sont d'un jaune très pâle, quelque peu verdâtre vers l'extrémité et presque hyalines près du bord postérieur; dans le champ plissé on voit une tache d'un noir bleuté et quelques mouchetures grisâtres du côté extérieur; dans la ♀ le champ antérieur est roussâtre et le reste d'un jaune pâle, avec la tache noire de la base plus grande que dans le mâle.

##### 4. *Oxythespis granulata* Saussure.

*Loc.* S. Oued Mya, Algerian C. Sahara, 8. iv. 1912 (E. Hartert).

Etant arrivé à réunir jusqu'à quatre espèces de ce genre, rare partout, et possédant des individus ♂ et ♀, je me suis persuadé que sa place actuelle dans le système des orthoptères est fautive, car d'une part, les fémurs qui sont carénés, et d'autre part, la forme aplatie des cerques le relie aux Vatiidae, où il doit prendre place à côté des *Heterocheta*, si toutefois ces deux genres ne doivent pas se réunir pour former un seul et même genre. La plupart des auteurs n'ont pas connu ces genres en nature, et ils ont suivi M. de Saussure, qui lui-même, lors de la création du genre, n'en avait connu que le ♂, ou du moins n'avait eu sous les yeux que des femelles mutilées ou mal conservées, ce qui explique que cette erreur ait pu subsister jusqu'aujourd'hui. Voici, en effet, la démonstration de ce que je viens d'affirmer.

M. de Saussure, dans la description du genre *Oxythespis* (Mantides, 1870), ne donne pas les caractères de la femelle, il dit seulement: "Les deux sexes ont des formes semblables;" et plus loin en décrivant *O. senegalensis*, il ne parle des femelles que pour dire "♀ ocelles très petits." Du *O. granulata* il n'en a connu non plus que le mâle. Il est donc sûr du moins que les exemplaires ♀ dont s'est servi M. de Saussure n'avaient pas l'abdomen complet, ce qui l'a empêché de connaître la forme si extraordinaire des cerques, qui sont tout à fait aplatis comme dans *Heterocheta*. Il est curieux pourtant qu'en partant d'un préjugé contraire au rapprochement de ces genres, il soit arrivé à saisir intuitivement, pourrait-on dire, la relation qui existe entre eux et qu'il a exprimée dans ces termes: "Les *Oxythespis* forment parmi les Nudipèdes le type correspondant des *Heterocheta*; elles en diffèrent toutefois par leurs pattes simples, non lobées, par des élytres plus membraneux, des ailes non colorées, et probablement aussi par des *cerci simples*"; et plus loin, en parlant du g. *Heterocheta*: "Il se rapproche beaucoup aussi des *Oxythespis*, dont il diffère cependant par ses pattes encore revêtues de lobes foliacés, par ses ailes colorées et surtout par sa plaque suranale très courte." Cette dernière observation incline vraiment à confusion, car, à cette époque M. de Saussure n'avait rien signalé encore quant à la forme des cerci ni même de la lame suranale des *Oxythespis*, et cependant dans

le tableau de la p. 177, il place ce genre dans la section *a a* : " Lamina supra analis elongata, lanceolata, acuta," ce qui ne s'observe dans aucune des espèces que je possède, qui ont toutes la lame suranale triangulaire, obtuse, presque transverse.

C'est cette fausse affirmation et la supposition relative à la forme des cerques qui a induit en erreur tous les auteurs, spécialement M. Finot qui, dans le tableau de la p. 90-34 des *Orthoptères d'Algérie et de Tunisie*, sépare *Heterochæta* Westw. d'*Oxythespis* Sauss., par la forme aplatie, foliacée des cerques; s'il avait pu soupçonner qu'*Oxythespis* avait des cerques aplatis, il aurait placé ce genre à côté de *Heterochæta*, et alors son *H. lemoroi* aurait été placée dans le genre *Oxythespis*, et il n'aurait pas créé plus tard le genre *Severinia*, qui est identique à *Oxythespis*.

Plus tard M. de Saussure a décrit *O. Turcomanica* du Turkestan, mais il n'a connu non plus que le ♂; cependant il aurait pu rectifier la position du genre *Oxythespis*, car il a observé la forme de la plaque suranale et des cerques : " La plaque supra-anale tronquée, en trapèze ou en carré plus large que long, subcarénée, cerci longs, entièrement comprimés en forme de ruban, larges, et composés de 7 articles apparents qui augmentent de grandeur, du premier au dernier, celui-ci arrondi."

Pour fixer avec sécurité la position de ce genre, il faut avoir égard aux carènes de ses fémurs postérieurs, caractère qui ne laisse aucun doute quant aux relations des *Oxythespis* avec les Vatiidae, auxquelles elles se reliait par une foule d'autres caractères autant qu'elles s'éloignent des Mantidae (voir de Sauss. l.c. p. 175). Il doit donc prendre place à côté des *Heterochæta* dont il diffère simplement par les pattes dépourvues de lobes, par les élytres plus membraneux, et par les ailes moins fortement colorées. Ce dernier genre est aujourd'hui réduit à deux seules espèces, *H. tenuipes* Westw. du Sénégal et *H. orientalis* Kirby de l'Afrique orientale.

Quant aux *Oxythespis* Sauss., on pourrait les diviser en égard à la disposition des antennes, en deux groupes, car les unes comme *O. O. senegalensis* et *granulata* Sauss., ont des antennes couvertes de poils nombreux, raides et assez forts au point de paraître plumbeuses, et les autres comme *O. O. turcomanica* Sauss., *maroccana* Bol. et *lemoroi* Finot, ainsi qu'une nouvelle espèce provenant de Perse que je décris ci-dessous les ont simples quoique pileuses.\*

\* *Oxythespis persica* sp. nov.

Dilute fusca. Caput sesqui latius quam longius. Oculi mammillati apice tuberculo conico, brevi, obtuse armati. Antennæ concolores, tenues, dilute et breviter villosæ. Pronotum indistincte granulose fere læve; marginibus fusco-spiculatis. Elytra pellucida fusco varia; venis fusco-maculatis, areis biserialium fusco-maculata, subfasciata. Alæ venis plurimis fuscis vel fusco-maculatis; campo radiato, præcipue antice fasciis longitudinalibus fuscis pluri-interruptis, venulis transversis pallidis; in ♀ alis fuscioribus. Pedes gracili; coxæ antice carinis fusco-maculatis, margine postica serrulata. Femora antica gracillima, sublinearia, medio leviter ampliata, fusco-varia. Pedes postici fusco variegati; femoribus superne distincte carinatis. Lamina supra-analis ♂ transversa, subtrigona, postice late rotundata. Cerci fortiter compressi, angusti, articulo ultimo apicem versus sensim attenuato, apice truncato. Lamina subgenitalis apicem versus attenuata; styli brevissimi. Lamina supra-analis ♀ valde transversa, brevis, postice rotundata. Cerci foliacei, medio latiores, articulis transversis, articulo ultimo fere longiore quam latiore et apice late rotundato. Lamina subgenitalis apice obtuse et breviter excisa. ♂ ♀.

	♂	♀
Long. corp. . . . .	38	40 mm.
„ pron. „ . . . .	10	11,5 „
„ elytr. „ . . . .	26	23 „
„ fem. ant. „ . . . .	7	8,2 „

*Loc.* Gotvend, Chagajor, Chimbar, Chindaar, Kouh sefid (Persia). Recueillis par M. M. de la Escalera.

La femelle est un peu plus robuste, le pronotum en est plus fortement granuleux et les élytres plus courts.

L'espèce pour laquelle M. Finot a proposé le genre *Severinia* Finot doit rentrer à n'en pas douter dans le genre *Oxythespis*.

Le placement du genre *Oxythespis* dans le Système des Mautides étant éclairci, et une fois démontré que *Severinia* Finot est un nom à substituer, il reste à examiner si l'espèce recueillie par Dr. Hartert dans le Sahara pourrait appartenir à *Oxythespis Lemoroi* Finot (*Heterochaeta* et *Severinia* Finot), seule espèce signalée jusqu'à présent comme habitant cette région. Tout d'abord on peut assurer que le ♂ décrit par M. Finot comme *Severinia* (= *Heterochaeta* Finot hand Westw.) diffère absolument de ceux recueillis par Dr. Hartert par le prolongement apical des yeux, la pubescence très forte des antennes, le pronotum dont les bords ainsi que la carène médiane sont denticulés, par les ailes postérieures tout à fait hyalines, très légèrement flavescentes le long du bord antérieur et enfin, par le métatarse postérieur qui n'est pas plus long que les deux articles suivants pris ensemble. Je dois avouer qu'*Oxythespis lemoroi* (*Severinia* Finot) ♂ ne me semble pas correspondre à la ♀ décrite sous le même nom, la disposition des yeux étant très diverse, et il n'a pas été démontré que dans les *Oxythespis* les yeux puissent varier selon le sexe. Cela ne se voit pas dans les autres espèces.

L'*Oxythespis* recueilli par Dr. Hartert me semble appartenir à *O. granulata* Sauss., car il n'y a que cette espèce et *O. senegalensis* Sauss. qui aient des antennes plumenses. Or, cette dernière espèce a été signalée comme se trouvant en Tunisie (Bonnet et Finot, Muséum de Paris, d'après Espina), aux environs de Sfax, à l'état de nymphe, signalement quelque peu indécis, car l'un des auteurs, M. Finot, affirme à continuation qu'il n'a point vu l'espèce (*Orth. d'Alg. et de Tunisie*, pp. 106-80), et parce que dans les *Orth. de la Rég. de Tunis* nous lisons, p. 22 : "Cette espèce n'a été probablement trouvée en Tunisie que d'une façon accidentelle; nous la citons d'après une nymphe de la coll. du Muséum, capturée aux environs de Sfax par Espina et étiquetée par M. de Saussure." Notre espèce se rapporte au contraire au *granulata* Sauss., et comme la description de cette dernière est assez incomplète nous croyons utile de la refaire.

### *O. granulata* (Saussure).

Flavescens. Caput sesqui latius quam longius, oculos computatos. Oculi compressi mammillati, apice dente conico obtusato. Antennae pallidae, medium corporis attingentes, longe hirsutae. Pronotum sparse et minute tuberculatum, marginibus ubique regulariter dentatis, carina media a latere visa subserrata. Elytra membranacea, hyalina, antice angustissime et dilute flavescentia, venulae pallidae, haud maculatae. Alae hyalinae, margine antico praecipue apicem versus dilutae, flavescentes; disco maculis brunneis, raris, sparsis. Pedes parum distincte griseo-fasciati. Coxae anticae marginibus subgranulatis. Femora antica laeviter granulosa. Abdomen gracile. Lamina supra-analis brevissima, transversa, apice obtusa. Cerci laminati, compressi, foliacei ubique aequae lati, articulo ultimo angustiore apice rotundato-subangulato. Lamina subgenitalis apice attenuata, cercis distincte breviora; stilis brevissimis. ♂.

Long. corp. . . . .	♂ 45 mm.
„ pron. . . . .	10
„ elytr. . . . .	22
„ fem. antic. . . . .	6, 5

5. *Blepharopsis mendica* (F.).

*Loc.* El-Golea, Alger. Sahara, 20. v. 1912 (Hartert); Ghardaïa, 16. iv. 1911 (W. Rothschild et Hartert).

L'espèce se trouve depuis les îles Canaries jusqu'en Syrie.

FAM. LOCUSTIDAE (*Acrididae* anct.).6. *Acrida nasuta* L.

*Loc.* Biskra, South Algeria (W. Rothschild et Hartert).

C'est une espèce presque cosmopolite; elle a été signalée en Europe, Asie, Afrique et jusqu'en Australie. En Europe elle habite le Midi.

7. *Acridella unguiculata* (Rb.).

*Loc.* Sands of El-Arich, S.E. Touggourt, 8-9. vi. 1912 (Hartert); N. of El-Golea, Alger. Sahara, 20. v. 1912 (Hartert).

Espèce plus méridionale que l'antérieure. Midi de l'Espagne et Sicile, Egypte, Algérie, Sénégal et d'autres régions de l'Afrique ainsi qu'en Syrie.

8. *Platypterna rothschildi* sp. nov.

Pallide cervina. Caput superne indistincte carinulatum, rugulosum, utriusque lineis duabus fuscis pone oculos percurrentibus. Fastigium transversum autice obtusum; lateribus ante oculos obtusangulatis, intus impressis; foveolis basique costæ frontalis fusco marmoratis; illis impressis, marginatis, brevibus. Frons valde reclinata, tota fusco-punctata, marginibus tantum lævibus; costa inter antennas et ocellum late sulcata, prope basin haud vel indistincte subampliata; carinis lateralibus frontibus curvatis. Oculi oblongi, breves. Antennæ usque medium depressæ, prope basin læviter dilatatæ, dimidio apicali filiformes. Pronotum dorso albido pruinoso, tricarinato, carinis externis in metazona retrorsum divergentibus; margine postico obtusangulato-rotundato; metazona quam prozona parum sed distincte breviora: lobi deflexi ad dorsum fusco induti, fere longiores quam altiores, inferne angustiores, margine inferiore valde sinuato-undato, supra coxas anticas lobato-rotundato. Elytra longa apicem femorum posticorum tertia parte longiora; basi extus pallida, venis radialibus anguste fuscis, venis omnibus punctis minutissimis fuscis variegatis. Femora postica elongata; parte filiforme ante-apicali explicata; intus flavescens, lobo geniculari interno macula magna nigra ornata. Tibiæ posticæ apicem versus sensim et valde ampliatae, dimidio, apicali roseæ, spinis apice nigris. Tarsi brevissimi, pallidi ♀.

Long. corp.	.	.	.	♀	44	mm.
„ pron.	.	.	.		7,5	„
„ elytr.	.	.	.		41	„
„ fem. post.	.	.	.		20	„

*Loc.* El-Golea, Algerian Sahara, 10-13. v. 1912 (Hartert).

Cette espèce est celle de plus grande taille, elle se distingue de *P. tibialis* Fieb. en ce que le fastigium du vertex n'est pas caréné, et que les yeux sont plus courts et plus larges. Le bord inférieur des lobes latéraux du pronotum distinctement avancé

an milieu sur les cuisses antérieures, et les fémurs postérieurs bien plus longs avec leur tiers apical grêle, contribuent aussi à distinguer cette espèce si notable.

Je me fais un plaisir de dédier cette espèce à l'Hon. L. W. Rothschild, qui a organisé ce voyage au Sahara si intéressant pour la connaissance de la faune de cette région.

### 9. *Platypterna geniculata* sp. nov.

Pallide flava. Caput elongatum, supra subcarinulatum et utrinque fusco-lineatum. Vertex oculo parum superans. Fastigium trigonum, obtusum, antice angulato-rotundatum a latere visum valde obtuse rotundatum. Foveolæ verticis angustæ, elongatæ, marginatæ, ante apicem verticis terminatæ. Frons rugulosa et impresso punctata, valde reclinata : costa frontalis inter antennis valde dilatata, inter antennis et ocellum coarctata. Antennæ prope basin modice dilatatæ, deplanatæ apicem versus sensim angustatæ, dimidio apicali filiformes. Pronotum dorso carinis tribus valde distinctis lateralibus retrorsum sensim divergentibus, margine postico obtusissimo, subrotundato ; lobi laterales fere æque alti et longi, deorsum angustati ad carinam dorsalem infuscati, angulo antico inferiore recto haud hebetato, margine inferiore subrecto. Elytra apicem femorum posticorum quarta parte longiora, apicem abdominis superantia. Femora postica latiuscula, parte filiforme apicali sub nulla, abdomine breviora ; lobo geniculari interno macula magna ovata nigra ornato. Tibiæ posticæ dilute rosæ, spinis apice nigris. Tarsi flavescentes.

var. Lobi deflexi pronoti medio fascia longitudinali fusca. Elytrorum venis radialibus linea fusca apposita, ♂ ♀.

	♂	♀
Long. corp. . . . .	25	40 mm.
„ pron. . . . .	4, 5	6, 8 „
„ elytr. . . . .	23	40 „
„ fem. post. . . . .	12	19 „

*Loc.* South of El-Golea, Alger. Sahara 10-19. v. 1912 (Hartert).

Le ♂ de cette espèce est prochain du *P. gracilis* Krauss, par la forme de la tête, mais la taille de notre espèce est beaucoup plus forte et la forme des lobes latéraux du pronotum tout à fait différente. *P. geniculata* Bol. ressemble extrêmement à *P. tibialis* Fieb., et je ne doute pas qu'elle ait été confondue avec cette dernière.

### 10. *Platypterna harterti* sp. nov.

Pallide rufo-testacea, albido varia. Caput superne haud carinatum tænia lata albida longitudinali a vertice oriunda ornatum. Fastigium verticis subæquilatum trigonum, marginibus explicatis ante oculos distincte angulatis. Foveolæ obtusatæ, punctatæ. Frons reclinata fusco et impresso punctata, carinis subcallosis, lævibus, ante oculos et pone eos striga flavida. Antennæ, tertia parte basali tantum compressæ, ensiformes, dimidio apicali filiformes. Pronotum dorso dilute fusco-rufescente medio tænia albida ; carinis crassiusculis lævibus, pallidis, externis in prozona distincte inflexis et propter hoc prozona medio coarctata ; sulco typico fere in medio sito, metazona postice subrotundata ; lobi deflexi fere altiores quam a basi longiores, margine inferiore subsinuato, obliquo ; margine antico albido vario ; disco medio striga callosa albida, fusco circumdata. Elytra femora postica quarta parte superantia, area scapulari basi striga flava, callosa ; campo anali pallido basi



extus rufescente. Femora postica extus in area externo-media ad carinam superiorem breviter infuscata, intus pallida, lobo geniculari interno concolore. Tibiæ posticæ pallide cœrulescentes, spinis apice nigris ♀.

Long. corp.	. . .	♀ 26,5	mm.
„ pron.	. . .	4	„
„ elytr.	. . .	23	„
„ fem. post.	. . .	12,5	„

*Loc.* Ain Guettara, north of In-Salah, 12-14. v. 1912 (E. Hartert).

Le Dr. Krauss a décrit deux nouvelles espèces de *Platypterna*,\* mais notre espèce ne peut se rapporter à aucune d'elles, bien qu'elle soit prochaine du *P. filicornis* Krauss, principalement par la taille, l'obliquité du front et la forme des lobes latéraux du pronotum. *P. harterti* a le vertex plan et plus oblique, la tête plus aiguë à l'apex, et non carénée en dessus, les yeux plus allongés et les carènes du pronotum flexueuses au milieu de la prozone; enfin, les lobes internes géniculaires sont dépourvus de la tache noire qui existe dans l'espèce de Krauss.

Je dédie cette espèce au savant ornithologiste qui l'a capturée au Sahara, Dr. Ernst Hartert.

### 11. *Platypterna kraussi* sp. nov.

Straminea. Caput haud nigropunctatum, pone oculos fascia lata ochracea per lobos laterales usque marginem posticum pronoti perducta; carinula media verticis explicata, retrorsum evanida. Vertex obtusangulatus, subtransversus, antice obtusatus, a latere visus, oculo fere tertia parte brevior; foveolis rectangularibus perfecte explicatis, læviter curvatis. Oculi anguste ovati, oblique positi. Antennæ basi dilatatae, apicem versus sensim angustatae, pone medium filiformes. Pronotum superne unicolor, læve, impunctatum; metazona suaviter rugulosa, punctata; carina media læviter explicata, lateralibus rectis, retrorsum vix divergentibus; lobi laterales æque longi et alti, margine postico recto, haud sed indistincte sinuato, margine inferiore subrecto, lævissime undulato. Elytra abdomine quinta parte superantia, vitta scapulari opaca, albida nec non venis radialibus anguste fuscis ornata. Femora postica concolora apicem abdominis haud attingentia; area externo media superne ad carinam lineæ angusta fusca; intus lobo geniculari macula nigra signato. Tibiæ posticæ sordide cœrulescentes, spinis et calcaribus apice nigris ♀.

Long. corp.	. . .	♀ 32	mm.
„ pron.	. . .	5,5	„
„ elytr.	. . .	28	„
„ fem. post.	. . .	13	„

*Loc.* Ain Guettara, north of In-Salah, 12-14. iv. 1912 (Hartert).

C'est aussi une espèce prochaine du *P. filicornis* Krauss, mais à vertex moins convexe, ce qui fait paraître le fastigium plus saillant et aigu; en même temps les yeux sont plus étroits et plus allongés, les fovéoles du vertex droites, le bord inférieur du pronotum flexueux et le postérieur droit; la tête et le pronotum dépourvus de points noirs enfoncés.

Le Dr. H. Krauss a contribué beaucoup à la connaissance des espèces de ce genre en faisant connaître ces deux espèces du Sahara.

\* "Beitrag zur Kenntniss der Orthopterenfauna der Sahara," in *Verh. K.K. Zool.-Bot.-Ges. in Wien* 1902.

Les espèces de *Platypterna* pourraient se distinguer à l'aide du tableau suivant :

1. Frons valde obliqua a latere visa vertice producto, acuto ; oculis valde obliquis ; antennæ distincte ensiformes.
2. Frons fortiter reclinata.
3. Oculi subrotundati ; carinis lateralibus frontis valde curvatis  
1. *P. currifrons* Bol.
3. Oculi oblongi, carinis lat. frontis rectis.
4. Lobi laterales pronoti versus marginem inferiorem haud angustati  
2. *P. gracilis* Krauss.
4. Lobi laterales pronoti inferne distincte angustioribus.
5. Fastigium verticis acutiusculum, ante oculos fere longius quam latius  
3. *P. acuta* Bol.
5. Fastigium verticis ante oculos transverse trigonum vel æquilaterum.
6. Fastigium a latere visum dimidio oculorum æquante : foveolæ elongatæ, marginatæ, læves ; fastigium verticis ante oculos æquilaterum, medio carinatum.
7. Foveolæ verticis elongatæ subrectæ ; metazona quam prozona vix breviora  
4. *P. tibialis* Fieb.
7. Foveolæ verticis breves, curvatae ; metazona quam prozona valde breviora  
5. *P. intermedia* Bol. —
6. Fastigium verticis a latere visum dimidio oculorum haud attingens, ante oculos transversum, medio haud carinatum ; foveolæ subrepletæ.
8. Statura majore ; femora postica ante apicem distincte filiformia ; lobi laterales pronoti margine externo undato medio distincte lobato  
6. *P. rothschildi* Bol.
8. Statura minore ; femora postica ante apicem haud filiformia, lobi laterales pronoti margine externo recto indistincte subsinuato  
7. *P. geniculata* Bol. —
2. Frons minus obliqua ; fastigium verticis a latere obtusum.
9. Femora postica elongata, apicem versus gracilia . . . 8. *P. pruinosa* Br.
9. Femora postica latiuscula, apicem versus parum attenuata  
9. *P. latipes* Bol.
1. Frons parum obliqua a latere visa cum verticem obtuse rotundata ; oculis parum obliquis subverticalibus.
10. Antennæ distincte ensiformes, vertex in longitudinem planulum.
11. Foveolæ verticis subrepletæ punctatæ ; pronoti carinis lateralibus in prozona inflexis ; lobi laterales striga callosa media longitudinale  
10. *P. harterti* Bol. —
11. Foveolæ verticis explicatæ marginibus acutis ; pronoti carinis lateralibus rectis, lobi laterales striga callosa nulla . . . 11. *P. kraussi* Bol.
10. Antennæ angustissime ensiformes, subfiliformes. Vertex in longitudinem convexus.
12. Lobi laterales pronoti inferne leviter sinuati ; statura majore  
12. *P. flicornis* Krauss. —
12. Lobi laterales pronoti inferne valde sinuati ; statura minore  
13. *P. martini* Bol

12. *Locusta danica* L.

*Loc.* Biskra, South Algeria (W. Rothschild et E. Hartert).

Elle était déjà connue de cette provenance.

C'est l'espèce connue généralement sous le nom de *Pachytylus cinerascens* F. Mr. Kirby a rétabli le nom de *Locusta* pour ce genre.

13. *Thalpomena algeriana* (Lucas).

*Loc.* Hammam R'hira, North Algeria (W. Rothschild et Hartert), v. 1911.

Elle habite également la Tunisie et l'Algérie. Une variété de cette espèce se trouve aussi au Maroc.

14. *Hyalorhipis canescens* (Saussure).

*Loc.* N. El-Golea, Alger. Sahara, 18-20. v. 1912, Hartert; S. Oned Mya, Algerian C. Sahara, I. v. 1912 (Hartert).

Elle n'avait pas été signalée en Algérie. *H. calcarata* Voss. diffère assez de cette espèce par la taille et par d'autres caractères qui ont été décrits par M. Vosseler.\* Le *H. canescens* Sauss. n'avait pas été signalé en dehors de l'Égypte et de la Syrie.

15. *Leptopternis rothschildi* sp. nov.

Gracillimus, canescens. Caput postice brunneo trifasciatum, scutellum verticis inter oculos antrorsum sensim ampliatur, antice marginibus convergentibus, haud carinulatum, fusco-punctatum. Costa frontalis ad verticem subcoarctata, inter oculos et antennas carinula media instructa, ante ocellum marginibus valde divergentibus, usque clypeum continuata. Frons nigro punctata. Oculi globosi, exserti brunneo-maculati. Antennae graciles, filiformes, pallidae. Pronotum superne brunneo-rufescens, lineis retrorsum divergentibus atque maculis in prozona albidis; prozona ante sulcum primum breviter carinulata, metazona carina media distincta, quam prozona fere duplo longiore, postice rectangulata, apice rotundata, fusco punctata et subfasciata; lobi deflexi albidi, vitta media longitudinali brunneo-flavescente, medio impressi, paralleli, angulo postico rotundato, subtus obtusissime angulati, margine infero obliquo, subrecto. Elytra linearia basi tantum coriacea et cervina, apicem versus pellucida, apice rotundata, brunneo maculata, prope basin fascia imperfecta transversa; campo discoidali linea brunnea in maculas distantes soluta; vena intercalata vena media apicem versus fere contigua; area intercalata postica extus latiora; vena ulnaris furcata, ramo antico diviso, ramulo postico in vena ulnaris postica ante apicem areae analis terminata; area furcae ulnaris postica uniseriatim areolata, areolis intermediis subquadratis; area furcae ulnaris antica per venam spuriam divisam. Areis campi apicalis venis spureis intercalatis. Alae limpidae, venis transversis albidis, longitudinalibus, raris angustissimis, nigris. Femora postica albida, superne transverse brunneo trifasciata, pagina interna dilute flava. Tibiae posticae albidae, spinis apice nigris, calcaribus internis apicem metatarsi haud attingentibus. Tarsi postici breves. Mesosternum latum, quam metasternum subbrevis ♂.

\* *Zool. Jahrb.*, xvi. Bd. 1902, p. 383

Long. corp. . . . .	♂	17	mm.
„ pron. . . . .		2,8	„
„ elytr. . . . .		19	„
„ fem. post. . . . .		8	„

*Loc.* Oued Nssa, entre Ghardaïa et Guerrara, 3-5. vi. 1912 (Hartert).

Jusqu'à présent, on ne l'avait trouvé qu'au Turkestan.

Prochain du *L. gracilis* il en diffère par de nombreux caractères, notamment par la carène du front, la forme du vertex, la coloration, la vénelation des élytres et les proportions du méso- et du métasternum.

#### 16. *Sphingonotus brunneri* Saussure.

*Loc.* S. Oued Mya, Alger. C. Sahara, 1. v. 1912 (E. Hartert).

Cette espèce très prochaine du *S. balteatus* Serr. se distingue principalement par les taches noirâtres que présente l'aile près de l'apex. Je considère *S. brunneri* Sauss. comme une bonne espèce. M. Finot a décrit sous le nom de *Lameerei* une espèce du Sahara, chassée entre Ouargla et Mellala (*Ann. Soc. Ent. de Belgique*, xlvii. 1902, p. 434), que je ne puis considérer comme différente de celle-ci, car la description peut s'appliquer exactement à l'exemplaire recueilli par Dr. Hartert. D'autre part, cet exemplaire est identique à ceux de ma collection provenant d'Égypte. M. Finot ne semble pas avoir connu l'espèce de Saussure, car autrement il aurait signalé les différences entre celle-ci et *lameerei*.

#### 17. *Sphingonotus cœrulans* (L.).

*Loc.* N. El-Golea, Alger. Sahara, 19. v. 1912 (Hartert); In-Salah, Tidikelt, Central W. Sahara, 24-30. iv. 1912 (Hartert); Biskra, South Algeria (W. Rothschild et E. Hartert); Aïa Guettara, north of In-Salah, 12-14. iv. 1912 (Hartert); Bordj Chegga, south of Biskra, 21. ii. 1912 (Hartert).

C'est l'espèce la plus commune des *Sphingonotus* depuis les îles Canaries jusqu'en Égypte, elle s'étend aussi en Syrie et jusque dans le Turkestan. Du reste, elle habite également l'Europe moyenne et méridionale.

#### 18. *Sphingonotus octofasciatus* (Serville).

*Loc.* Oued Nssa, entre Ghardaïa et Guerrara, 3-5. vi. 1912 (Hartert).

Signalée au Nord de l'Afrique, depuis l'Algérie jusqu'en Égypte.

#### 19. *Tmethis claveli* (Lucas).

*Loc.* El-Kantara, Algeria, v. 1909 (W. Rothschild et E. Hartert); Ghardaïa, 16. iv. 1912 (W. Rothschild et E. Hartert).

Signalée déjà à Ouargla et Ghardaïa par le Dr. Krauss. M. Finot considère cette espèce comme une forme intermédiaire entre *T. pulchripennis* Serv. et *cisti* Fabr. Les exemplaires recueillis par MM. Rothschild et Hartert appartiennent à la variété *mozabitica* Krauss.

#### 20. *Eremocharis insignis* (Lucas).

*Loc.* El-Kantara, Algeria, v. 1909 (Rothschild et Hartert); N. of El-Golea, Alger. Sahara, 20. v. 1912 (Hartert); Biskra, South Algeria (W. Rothschild et E. Hartert).

Signalée à Biskra, Oasis du Sahara, par Mr. Lucas, elle se trouve en Algérie et en Tunisie.

### 21. *Pyrgomorpha conica* (Olivier).

*Loc.* Ghardaïa, 16. iv. 1911 (W. Rothschild et Hartert); Hammam R'hira, North Algeria, v. 1911 (W. Rothschild et Hartert).

C'est l'espèce d'Europe; elle se trouve aussi dans tout le Nord de l'Afrique et en Asie mineure.

### 22. *Pyrgomorpha cognata* Krauss.

*Loc.* Oued Mya, Alger. C. Sahara, 4. v. 1912 (Hartert).

Le Dr. Krauss a signalé cette espèce à Ouargla et Ghardaïa.

### 23. *Dericorys albidula* Serville.

*Loc.* Sands of El-Arich, S.W. of Touggourt, 8-9. vi. 1912 (Hartert).

Cette espèce n'avait pas été signalée au Sahara. Le Dr. Krauss, et MM. Finot et Vosseler n'ont indiqué en Algérie et Tunisie que la *D. millierei* Finot, espèce beaucoup plus petite. *D. albidula* avait été trouvée seulement en Egypte et en Syrie. Elle ressemble beaucoup à *D. curvipes* (*Derocorystes curvipes* Redt.), "Beitr. zur Orthopt.-Fauna von Turkmenien," *Wien. ent. Zeit.*, viii. Jahrg. 1889, dont je possède un exemplaire, grâce à l'obligeance de l'auteur, mais elle se distingue par le vertex à peine caréné postérieurement; dans la *D. curvipes* la carène s'étend tout le long du scutellum du vertex. La crête au pronotum est plus haute et plus fortement arrondie, presque en demi cercle; les élytres sont plus courts. Cependant ces deux espèces sont très proches.

Je crois utile de décrire à nouveau cette espèce, qui n'a été décrite depuis Serville que dans l'ouvrage de Jacobs et Bianchi publié en russe—

### *Dericorys albidula* Serv.

Albido-cinereus, griseo-fusco variegatus. Antennae albido flavæ. Vertex declivis cum costa frontalis angulato-rotundato continuus. Foveolæ obsoletæ. Costa frontalis tota late sulcata ad ocellum subampliata. Oculi rufi. Pronotum marginem versus fusco-cæruleum, marginibus incrassatis, albidis, prozona antice angulato-producta, crista maxime elevata, rotundata, securiforme; lateribus convexis, margine superiore regulariter et valde arcuato; metazona postice obtusangulariter rotundata carina media subindistincta. Elytra fusco et albido tessellata; venis longitudinalibus roseo-ferrugineis. Alæ apice fuscae. Prosternum processu apicem versus sensim ampliatum, apice truncato subsinuatum; lobi mesosternales æque longi ac lati, intus rotundati, spatio angustiori sejuncti. Femora postica carinis serrulatis, area externo-media maculis albidis pennatis obsita; area supero-externa griseo-cærulea, maculis tribus obscurioribus subfasciata, area infero-externa cærulea; lobi geniculares flavo-albidi, nigrocærulei, supra intusque nigrocæruleo limbati. Tibiæ posticæ curvatae, apicem versus sensim angustatae, cinereæ, intus cærulescentes et apice purpureæ, spinis albidis nigro terminatis, medio annulo rufo. Tarsi pallide flavi ♀.

Long. corp. . . . .	♀	46 mm.
„ pron. . . . .		10 „
„ elytr. . . . .		48 „
„ fem. post. . . . .		26 „

24. *Orthacantacris ægyptia* (L.).

*Loc.* Biskra, South Algeria (W. Rothschild et Hartert); El-Kantara, v. 1909 (W. Rothschild et Hartert); Alger, 1-16. v. 1912 (Hartert); N. of El-Golea, 20. v. 1912 (Hartert).

C'est l'espèce connue sous le nom d'*Acridium ægyptium*; elle habite le Midi de l'Europe, le Nord de l'Afrique et l'Asie mineure.

25. *Schistocerca gregaria* (Forskål).

*Loc.* Aïn Guettara, N. of In-Salah, 12-14 iv. 1912 (Hartert).

De ce genre si nombreux c'est la seule espèce qui se trouve dans l'ancien monde; elle s'étend depuis le Sénégal jusqu'en Egypte. C'est une espèce nuisible qui arrive parfois en Europe et est ordinairement connue sous le nom de "Criquet pèlerin," et sous celui de *Schistocerca peregrina* Ol. par les auteurs. Le Dr. Krauss a remis en vigueur l'ancien nom de Forskål.\*

26. *Sphodromerus decoloratus* Finot.

*Loc.* Biskra, South Algeria (W. Rothschild et E. Hartert).

Signalée à la même localité par M. Finot.

27. *Eupreponemesis plorans* (Charpentier).

*Loc.* Biskra, South Algeria (W. Rothschild et E. Hartert).

Elle se trouve en Espagne, dans toute l'Afrique et en Asie.

28. *Thisiocetrus harterti* sp. nov.

Cervinus. Caput superne flavescens fascia longitudinali fusca nigro marginata retrorsum sensim ampliata, pone oculos cinereum et infra eos linea verticali nigra. Vertex inter oculos latus haud coarctatus. Costa frontalis inter antennis latissima, marginibus arcuatis, ante ocellum parallelis; convexa et vage impresso-punctata. Antennae filiformes, graciles, pone medium indistincte crassiores, apicem versus sensim attenuatae, pallidae. Pronotum antice subrotundatum, postice obtusissime angulatum, carina media laeviter elevata, lineari, percurrenti, canthis usque sulcum typicum acutiusculis, retrorsum divergentibus a sulcis transversis plus minusve dislocatis, in metazona obsolete, impresso-punctatis; dorso pallido, fascia lata fusca nigro marginata irregulariter delineata ubique fere aequae lata, prope marginem anticum sensim angustata: lobi deflexi antice posticeque suaviter rugosi, inter sulcos medios sublaevi, margine inferiore antice sinuato angulo postico late rotundato. Elytra apicem femorum posteriorum vix superantia, tota praecipue vena anali pallide cervina; area discoidali areolis minutis nigro-marginatis, in parte basali imperfecte, in parte apicali distincte transverse fusco fasciata; area inter venas discoidales anteriores fusco-maculata. Alae limpidae, basi diluissimae caeruleascentes. Femora postica valida intus imperfecte transverse nigro fasciata, extus tantum in area externo-media ad carinam superiorem interrupte nigro bi- vel trisignata. Tibiae posticae dimidio basali nigro, pallido annulatae dimidio apicali rufescentes; spinis basi pallidis apice nigro, extus 15, intus 13 armatae ♀.

\* Krauss, H., *Denkschriften der Math.-Naturwissenschaftl. Klasse der k. Akad. der Wissensch.*, Wien, 1907.

Long. corp. . . . .	♂	49 mm.
„ pron. . . . .		9 „
„ elytr. . . . .		38 „
„ fem. post. . . . .		25 „

*Loc.* Biskra (W. Rothschild et E. Hartert).

Cette espèce est procheaine du *Th. littoralis* Rambur d'Espagne, qui a été signalée à plusieurs reprises comme se trouvant en Algérie et ailleurs.

FAM. ACHETIDAE (*Gryllidae* anct.).

29. **Curtilla gryllotalpa** (L.).

*Loc.* In-Salah, Tidikelt, O. Sahara, 24-30. iv. 1912 (Hartert); Biskra, South Algeria (W. Rothschild et E. Hartert).

Cette espèce est commune en Europe et dans le Nord de l'Afrique, où cependant se trouve aussi une autre espèce, la *C. africana* Pal.

30. **Acheta bimaculata** (D. Geer).

*Loc.* El-Kantara, v. 1909 (W. Rothschild et E. Hartert); Biskra, South Algeria (W. Rothschild et E. Hartert).

Plus connue sous le nom de *Liogryllus*, espèce africaine qui s'étend jusqu'au centre de l'Espagne. Elle se trouve aussi dans presque toute l'Asie et aux îles de l'Océanie.

31. **Gryllus domesticus** L.

*Loc.* El-Golea, Sahara, 10-13. v. 1912 (E. Hartert).

Habite l'Europe et le Nord de l'Afrique.

32. **Gryllus hispanicus** Rambur.

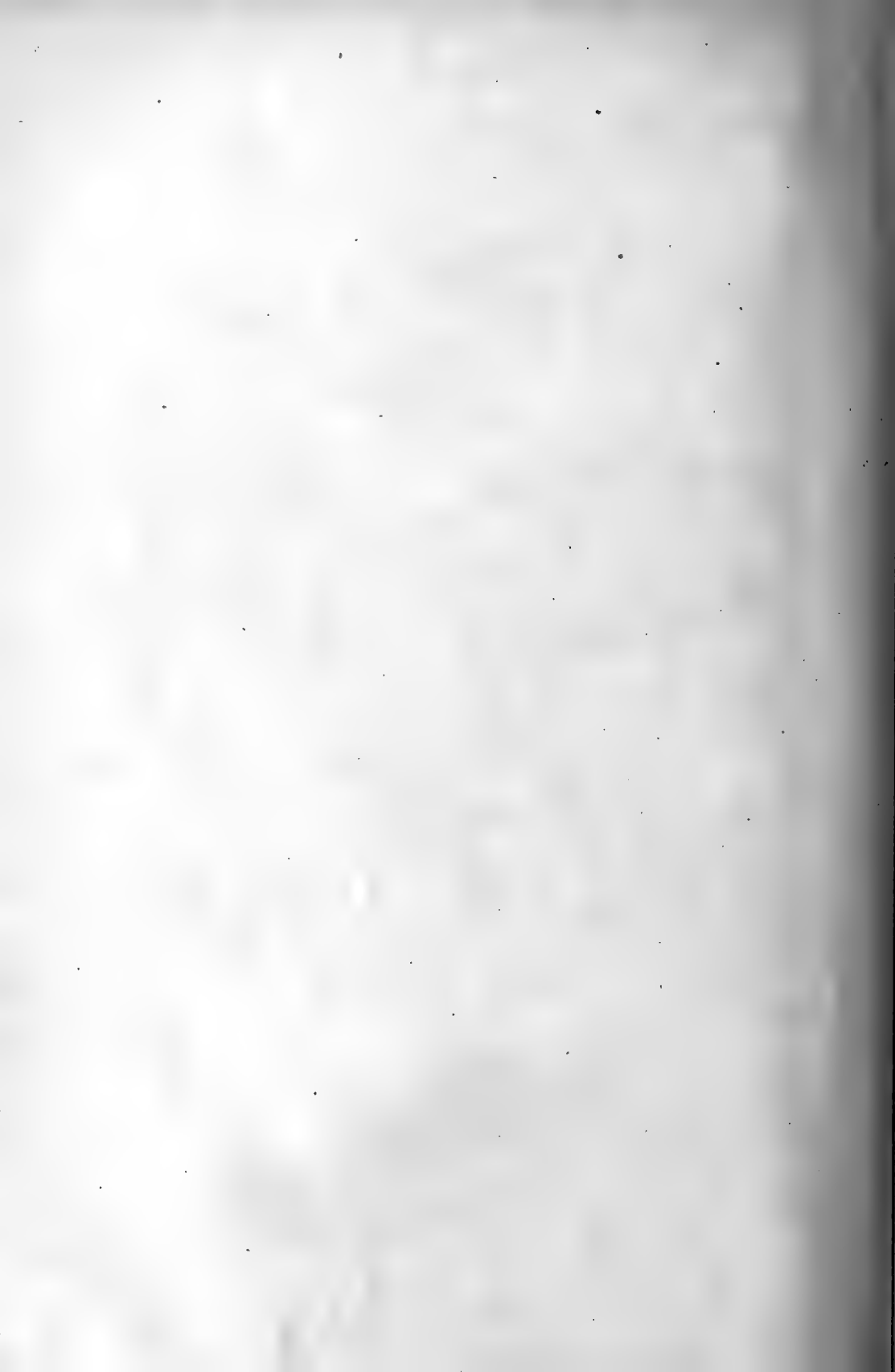
*Loc.* S. Oned Mya, Alger. O. Sahara, v. 1912 (E. Hartert).

Espèce méridionale, se trouve dans le Midi de l'Espagne et au Nord de l'Afrique; elle habite aussi Madère et les îles Canaries. M. de Saussure l'a signalée aussi au Sud de l'Afrique.

33. **Gryllus burdigalensis** Latreille.

*Loc.* Biskra (W. Rothschild et E. Hartert); El-Golea 10-13. v. 1912 (E. Hartert).

Mr. Kirby place ce nom parmi la synonymie du *Gryllus chinensis* Westw., ce qui ne me paraît pas suffisamment démontré. L'espèce est commune en Europe et dans le Nord de l'Afrique.





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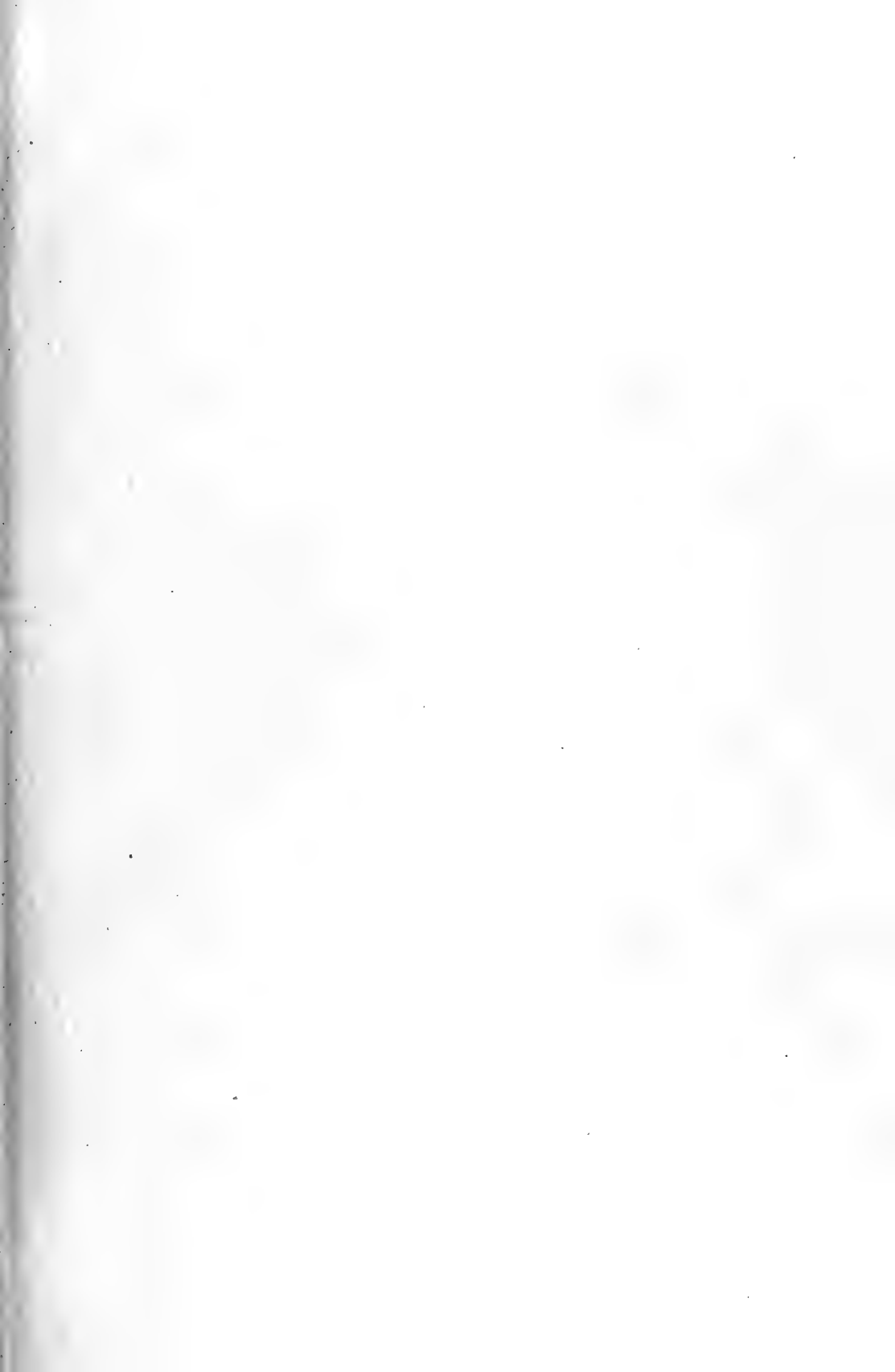


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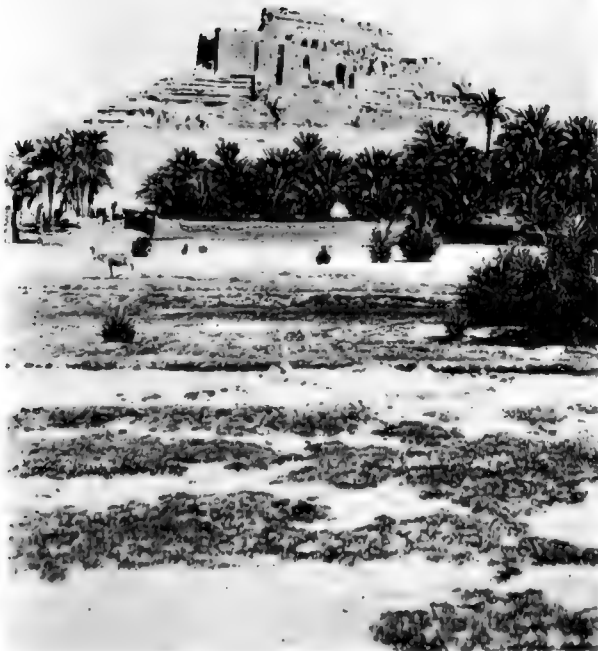
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OLD BERBER FORT OF EL-GOLEA.



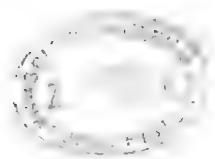




CAMP AT HASSI OKSEIBAT, SOUTH OF EL-GOLEA.

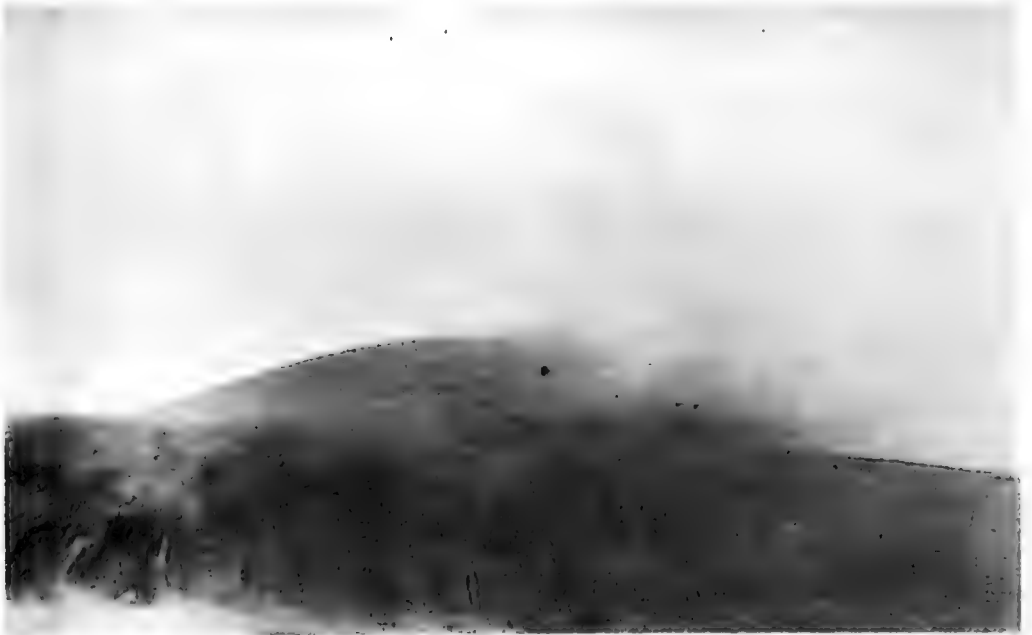


FIG. II OF *NITRARIA TRIDENTATA* WITH NEST OF *PASSER SIMPLEX*, HASSI OKSEIBAT.





CROSSING SAND-DUNES ON APRIL 1ST.



SAND-DUNES IN A GALE.





LIEUTENANT COLLOT'S GRAVE IN THE DESERT.



WELL NEAR EL-ALIA.

(Stone-heaps and walls of wells are used as nesting-sites by *Passer simplex*.)





GARA IN THE CENTRAL SAHARA.



POST-RIDER ON THE PLATEAU OF TADEMAÏT.







MIDDAY REST AT A TILMAS IN THE BED OF A TRIBUTARY OF THE SOUTHERN OUED MYA.



NEST OF *TYMPANES PHOENICURUS ARENICOLOR*, EAST OF GHARDAJA.





BED OF SOUTHERN OUED MYA.

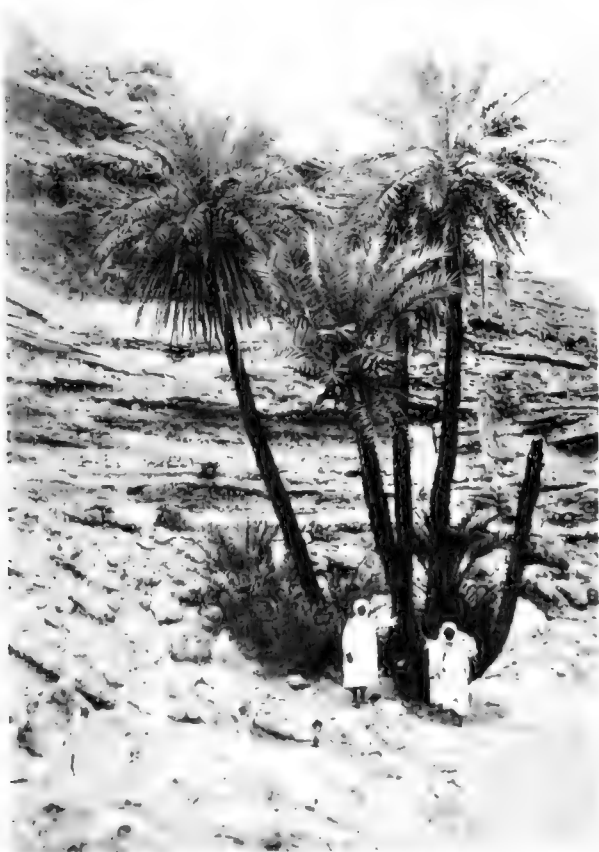


CAMP UNDER TAMARISKS, THOMAS DJILICHEMPT, SOUTHERN OUED MYA.





SOUTHERN ESCARPMENT OF PLATEAU OF TADEMAÏT, SOUTH OF AÏN GUETTARA.



AÏN GUETTARA





FORMATION BETWEEN IGOSTEN AND IN-SALAH.



CLAY-HILLS SOUTH OF OUARGLA; NESTING-PLACE OF *OBENANTHR LEUCOPYGA* AND *O. LUGENS*.







VILLAGE, IN-SALAH.



ACACIAS IN OUED SOUTH OF AIN GUETTARA.



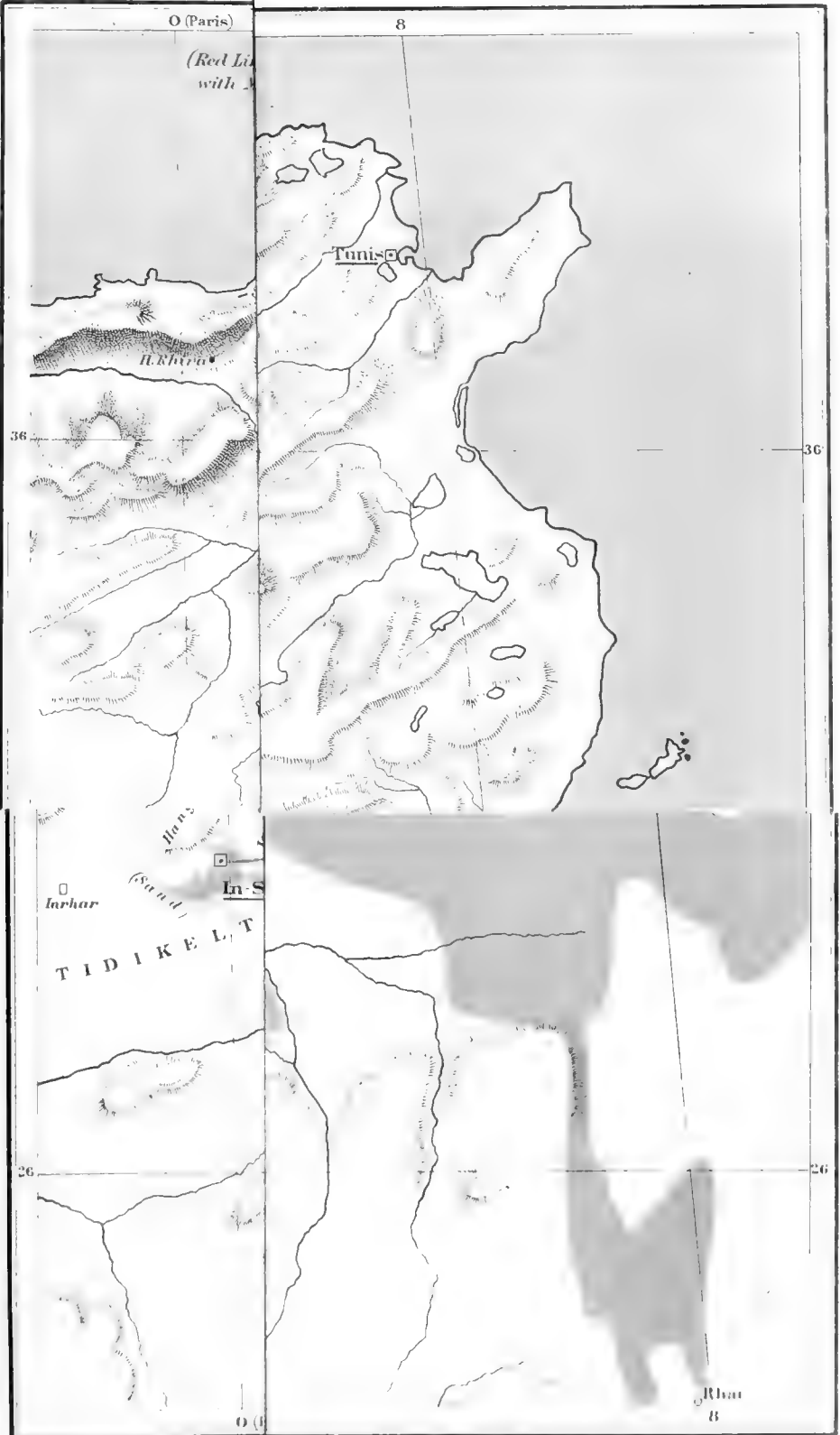


SAND-DUNES WITH HEDGES OF PALM-LEAVES. IN-SALAH.

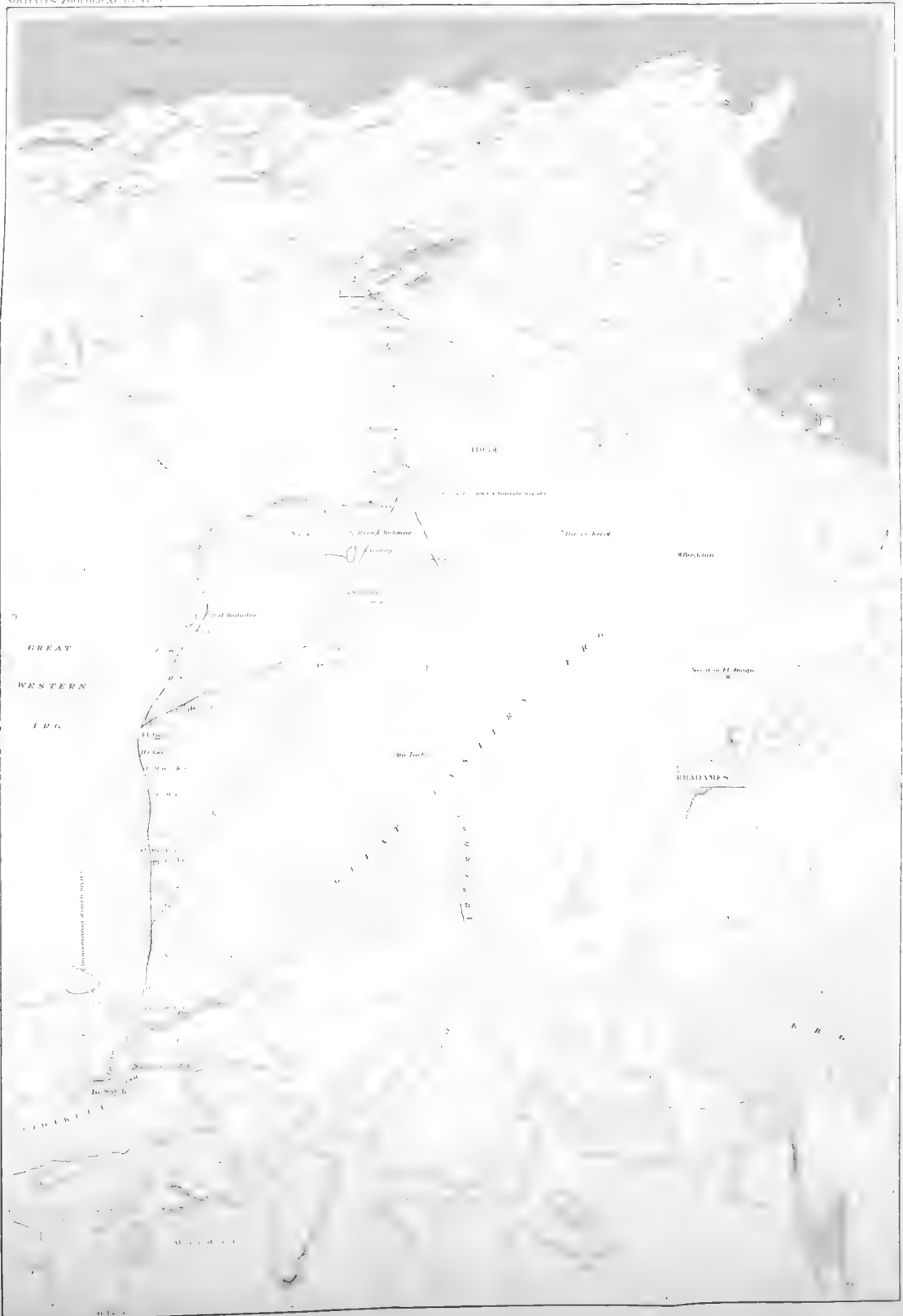


IN THE OASIS OF IN-SALAH.





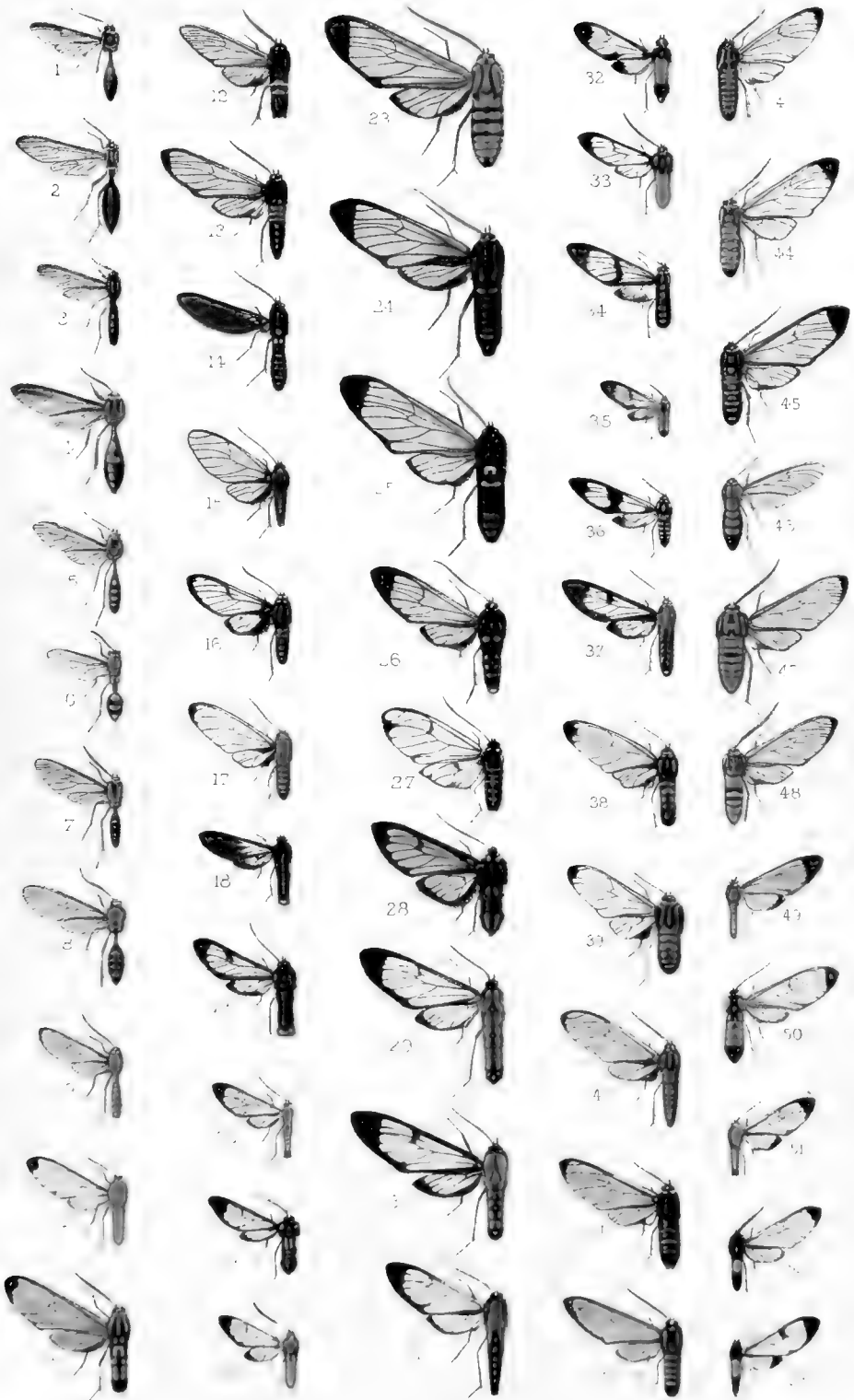
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*Pompilus polyspathus* sp. nov.

1. Head. 2. Antennae. 3. Wings. 4. Metatarsus anticus.

7



*Alastor (Antalastor) harterti* sp. nov.

5. Head. 6. Wings. 7. Abdomen. 8. Thorax and base of abdomen.





